



Accredited testing-laboratory

DAR registration number: DGA-PL-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.: 3462C-1 (IC)

Certification ID: DE 0001

Accreditation ID: DE 0002

Accredited Bluetooth® Test Facility (BQTF)

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Test report no. : 1-2166-01-04/10 A
Type identification : RCW41GW
Applicant : Research In Motion Limited
FCC ID : L6ARCW40GW
IC Certification No : 2503A- RCW40GW
Test standards : 47 CFR Part 15
RSS - 210 Issue 7

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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:

2010-04-21 Marco Bertolino
Date Name


Signature

2010-04-21 Meheza K. Walla
Date Name


Signature

Technical responsibility for area of testing:

2010-04-21 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: DGA-PL-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:	305 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:	2010-02-11
Date of receipt of test item:	2010-04-06
Date of start test:	2010-04-06
Date of end test:	2010-04-21
Persons(s) who have been present during the test:	-/-

2 Test standard/s

47 CFR Part 15	2009-10	Title 47 of the Code of Federal Regulations; Chapter I- Federal Communications Commission subchapter A - general, Part 15-Radio frequency devices
RSS - 210 Issue 7	2007-06	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

3 Technical tests

3.1 Details of manufacturer

Name:	Research In Motion Limited
Street:	305 Phillip Street
Town:	Waterloo, ON N2L 3W8
Country:	Canada

3.1.1 Test item

Kind of test item	:	Mobile Phone (GSM, GPRS, EGPRS, GPS, BT 2.0 + EDR, WLAN a/g/n)
Type identification	:	RCW41GW
S/N serial number	:	IMEI: 004401135893473
HW hardware status	:	CER-30952-001 Rev1
SW software status	:	Bundle info: 917 OS: v5.0.0.541 Platform: 6.1.0.5
Frequency Band [MHz]	:	ISM band 2.400 - 2.483,5 (2412 MHz – 2437 MHz – 2462 MHz)
Type of Modulation	:	DSSS & OFDM – BPSK, QPSK, 16 – QAM, 64 – QAM
Number of channels	:	11
Antenna	:	Integrated PCB antenna
Power Supply	:	3.7 V DC supplied by Li-Ion-Battery

Max. power radiated: 23.83 dBm (N-Mode)

Max. power conducted: Not performed

FCC ID: L6ARCW40GW

IC: 2503A-RCW40GW

3.1.2 Additional EUT information For IC Canada (appendix 2)

IC Registration Number:	2503A-RCW40GW
Model Name:	RCW41GW
Manufacturer (complete Address):	Research In Motion Limited 305 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 3462C-1
Frequency Range (or fixed frequency) [MHz]:	ISM band 2.400 - 2.483,5 (2412 MHz – 2437 MHz – 2462 MHz)
RF: Power [W] (max):	DSSS: B – Mode Rad. EIRP: 202.30 mW Conducted : not performed OFDM: G – Mode Rad. EIRP: 231.74mW Conducted : not performed OFDM: N – Mode Rad. EIRP: 241.55 mW Conducted : not performed
Antenna Type:	Integrated PCB antenna
Occupied Bandwidth (99% BW) [kHz]:	DSSS: Not performed! OFDM: Not performed!
Type of Modulation:	DSSS & OFDM
Emission Designator (TRC-43):	Not performed!
Transmitter Spurious (worst case) [dBμV/m in 3m]:	49.65 (noise floor)
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: Meheza K. Walla

Date: 2010-04-21

3.1.3 RF Technical Brief Cover Sheet acc. To RSS-102

GENERAL INFORMATION:

IC Certification ID:	2503A-RCW40GW
Model Number:	RCW41GW
RF exposure environment:	General Public Use

ATTESTATION:

I attest that the radiocommunication apparatus meets the exemption from the routine evaluation limits in Section 2.5 of this standard; that the Technical Brief was prepared and the information contained therein is correct; that the device evaluation was performed or supervised by me; that applicable measurement methods and evaluation methodologies have been followed; and that the device meets the SAR and/or RF field strength limits of RSS-102.

Signature:  Date: 2010-04-21

NAME:	Meheza K. Walla, Dipl.-Ing. (FH)
TITLE:	Expert
COMPANY:	Cetecom ICT Services GmbH

3.1.4 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

3.1.5 Extreme conditions testing values

Description	Shortcut	Unit	Value
Nominal Temperature	T _{nom}	°C	21
Nominal Humidity	H _{nom}	%	43
Nominal Power Source	V _{nom}	V	3.7

Type of power source: **DC supplied by Li-Ion-Battery**

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	2010-04-12	-/-

Test Specification Clause	Test Case	Pass	Fail	Not applicable	Not performed
None	Antenna Gain				Yes
§15.247 (e)	Peak power spectral density				Yes
§15.247(a)(2)	Spectrum Bandwidth of a DSSS System / 6dB BW				Yes
§15.247(a)(2)	Spectrum Bandwidth of a DSSS System / 20dB BW				Yes
§ 15.247 (b)(3)	Maximum output power (conducted)				Yes
§ 15.247 (b)(3)	Max. peak output power (radiated)	Yes			
§15.247 (d)	Band-edge compliance of conducted emissions				Yes
§15.205	Band-edge compliance of radiated emissions	Yes			
§15.247 (d)	Spurious Emission - conducted (Transmitter)				Yes
§ 15.209	Spurious Emission -radiated (Transmitter)	Yes			
§ 15.109	Spurious Emissions-radiated (Receiver)	Yes			
§ 15.209	Spurious Emissions-radiated <30 MHz	Yes			
§ 15.107/207	Conducted Emissions <30 MHz				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 20 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 set-ups 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.

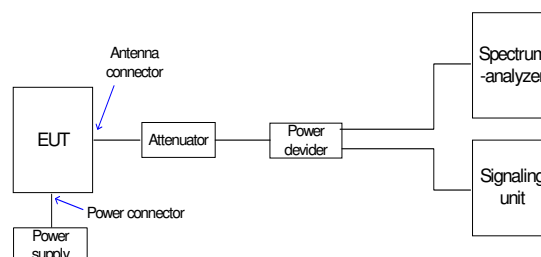
Antennas are confirmed with ANSI C63.2-1996 item 15.

9 kHz - 150 kHz: Quasi Peak measurement, 200 Hz Bandwidth, active loop antenna.
150 kHz - 30 MHz: Quasi Peak measurement, 9 kHz Bandwidth, active loop antenna.
30 MHz - 1GHz: Quasi Peak measurement, 120 kHz Bandwidth, Trilog antenna
>1GHz: Average, RBW 1MHz, VBW 10 Hz, waveguide horn

All measurement settings are according to FCC 15.209 and 15.207

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 connected to the spectrum analyzer. The specific losses for signal path are first checked within a calibration. The measurement readings on the 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 Antenna gain

Not performed!

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.

	low channel	mid channel	high channel
Conducted power [dBm] (<i>measured</i>)			
Radiated power [dBm] (<i>measured</i>)			
Gain [dBi] (<i>calculated</i>)			

5.5 Peak Power Spectral density (digitally modulated systems) §15.247(e)

Not performed!

Limits:

Under normal test conditions only	For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission
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5.6 Spectrum Bandwidth of a DSSS System / 6 dB Bandwidth §15.247(a)(2)

Not performed!

Limits:

Under normal test conditions only	> 500 kHz
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5.7 Spectrum Bandwidth of a DSSS System / 20 dB Bandwidth

Not performed!

5.8 Maximum output power (conducted) §15.247 (b)(3)

Not performed!

Limits:

Under normal test conditions only, for frequency range 2400-2483.5 MHz	Max. 1.0 Watt / 30 dBm
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MPE calculation

These equations are generally accurate in the far field of an antenna but will over predict power density in the near field, where they could be used for making a “worst case” prediction.

$$S = PG/4\pi R^2$$

where S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units e.g. mW)

G = power gain of the antenna in the direction of interest relative to the isotropic radiator

R = distance to the centre of radiation of the antenna (appropriate units e.g. cm)

Or

$$S = EIRP/4\pi R^2$$

where EIRP = equivalent isotropically radiated power

Calculation:

(Calculated for max. EIRP)

EIRP: 23.83 dBm (241.55 mW)

calculated at distance of 20 cm:

$$\text{power density} = 241.55/4\pi 20^2 = 0.048 \text{ mW/ cm}^2$$

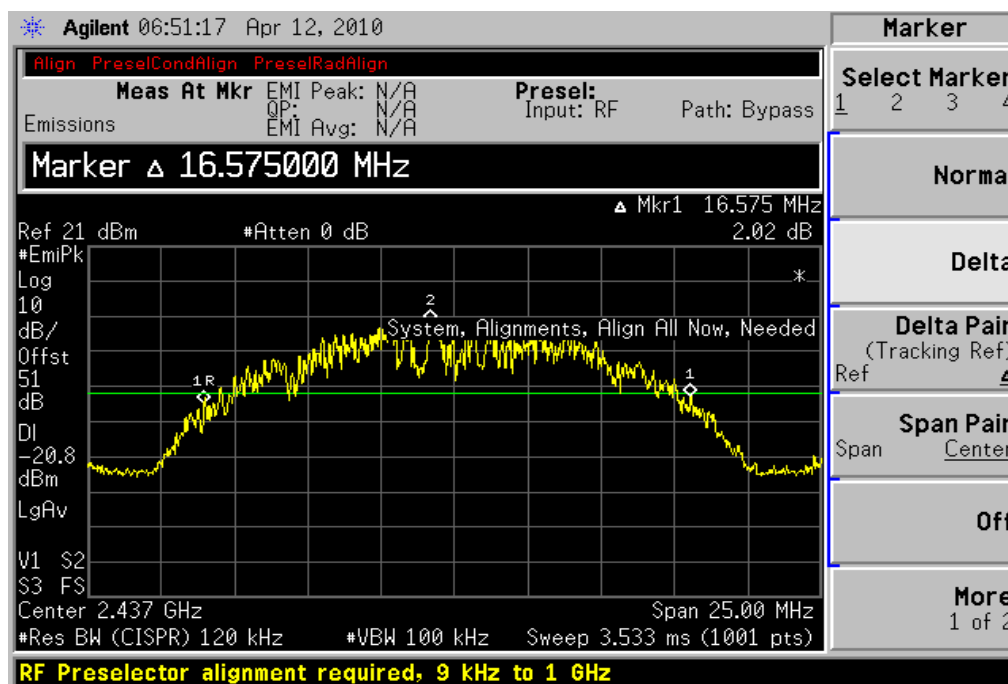
Limit:

1mW/ cm² is the reference level for general public exposure according to the OET Bulletin 65,
Edition 97-01 Table 1.

5.9 Max. peak output power (radiated) §15.247 (b)(3)

DSSS: B – Mode

Spectrum of the emission:



OBW: 16.575 MHz

Measurement settings:

RBW	10 MHz
VBW	8 MHz
Span	Zerospan
Trace	Max Hold
Det.	Max Peak

Correction factor for the output power measurement:

$$10 * \log (EBW/RBW) \text{ dB} = 10 * \log (16.575\text{MHz}/10\text{MHz}) \text{ dB}$$

Correction factor = 2.19 dB

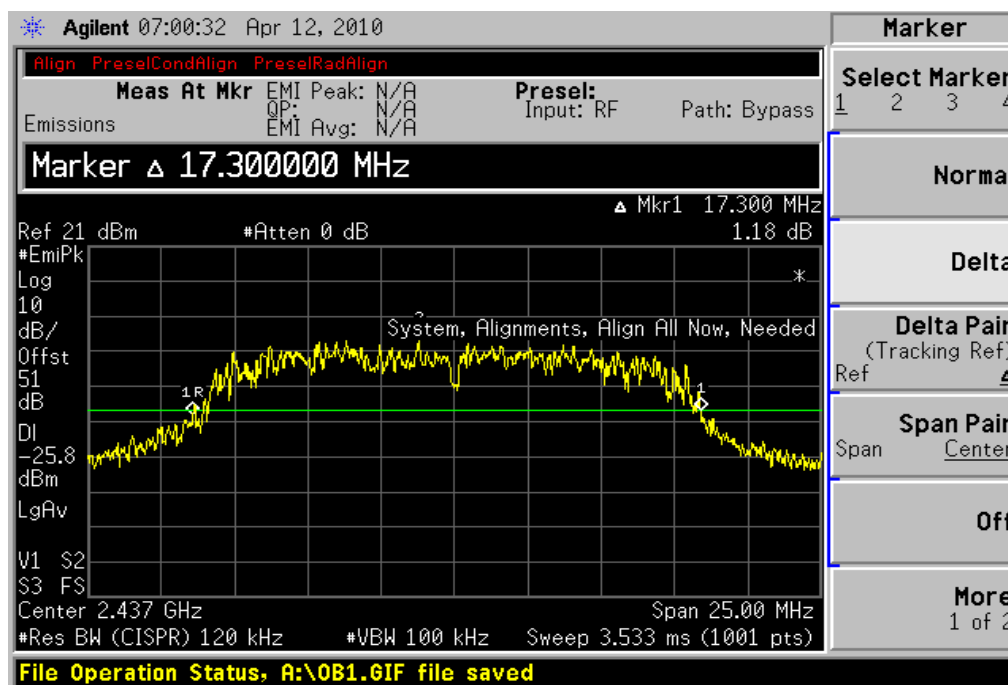
Results: B – Mode

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2412	2437	2462
T _{nom}	V _{nom}	22.05	22.36	23.06
Measurement uncertainty		±3dB		

Measured at a distance of 3m

OFDM: G – Mode

Spectrum of the emission:



OBW: 17.300 MHz

Measurement settings:

RBW	10 MHz
VBW	8 MHz
Span	Zerospan
Trace	Max Hold
Det.	Max Peak

Correction factor for the output power measurement:

$$10 * \log (EBW/RBW) \text{ dB} = 10 * \log (16.975\text{MHz}/10\text{MHz}) \text{ dB}$$

$$\text{Correction factor} = 2.29 \text{ dB}$$

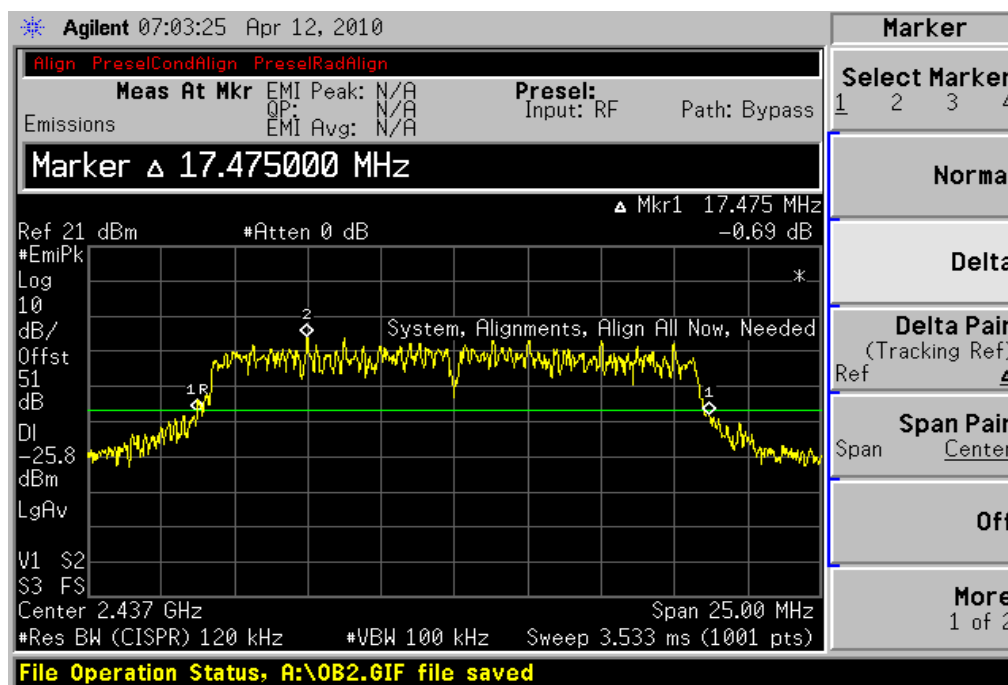
Results: G – Mode

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2412	2437	2462
T _{nom}	V _{nom}	22.35	23.65	22.08
Measurement uncertainty		±3dB		

Measured at a distance of 3m

OFDM: N – Mode

Spectrum of the emission:



OBW: 17.475 MHz

Measurement settings:

RBW	10 MHz
VBW	8 MHz
Span	Zerospan
Trace	Max Hold
Det.	Max Peak

Correction factor for the output power measurement:

$$10 * \log (EBW/RBW) \text{ dB} = 10 * \log (17.475\text{MHz}/10\text{MHz}) \text{ dB}$$

$$\text{Correction factor} = 2.42 \text{ dB}$$

Results: N – Mode

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2412	2437	2462
T _{nom}	V _{nom}	23.53	23.24	23.83
Measurement uncertainty		±3dB		

Measured at a distance of 3m

Limits:

Under normal test conditions only, for frequency range 2400-2483.5 MHz	Max. 1.0 Watt
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5.10 Band-edge compliance of conducted emissions §15.247 (d)

Not performed!

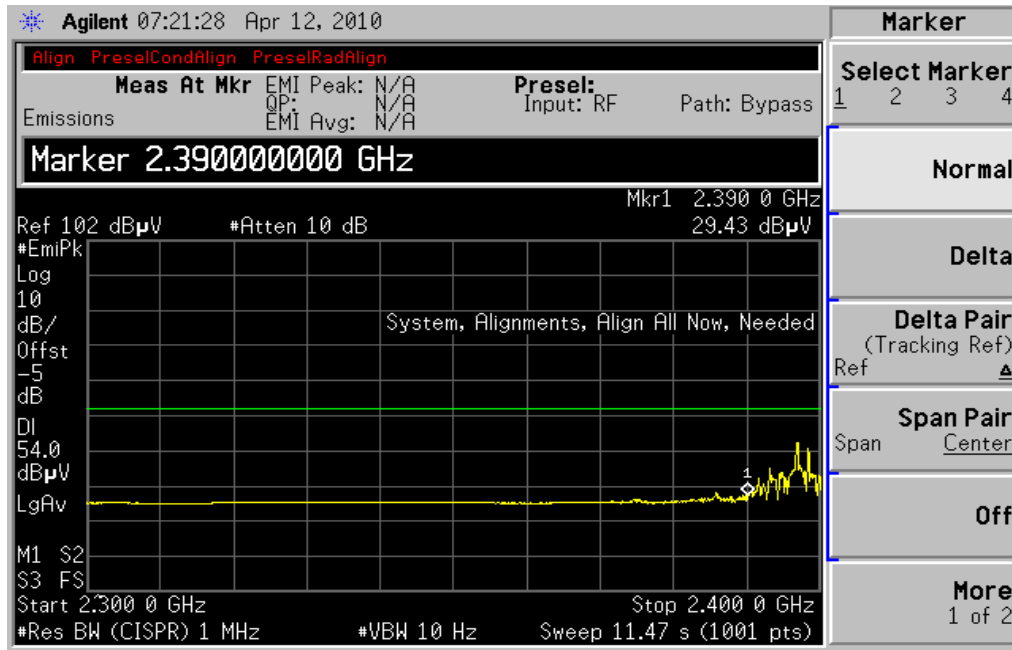
Limits:

Under normal test conditions only	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)).
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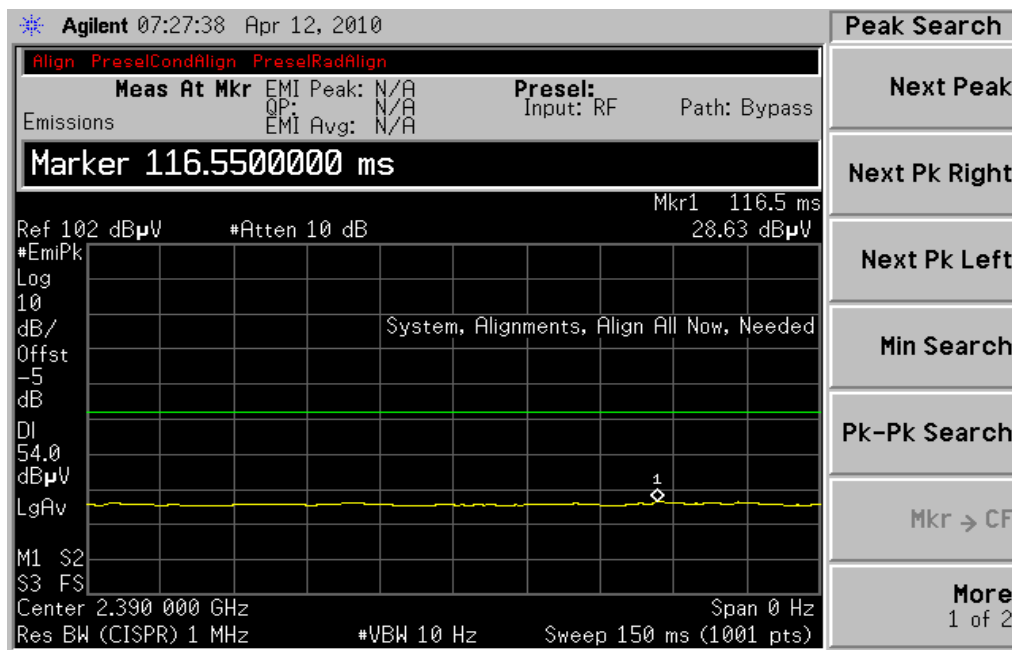
5.11 Band-edge compliance of radiated emissions §15.205

DSSS (B – Mode)

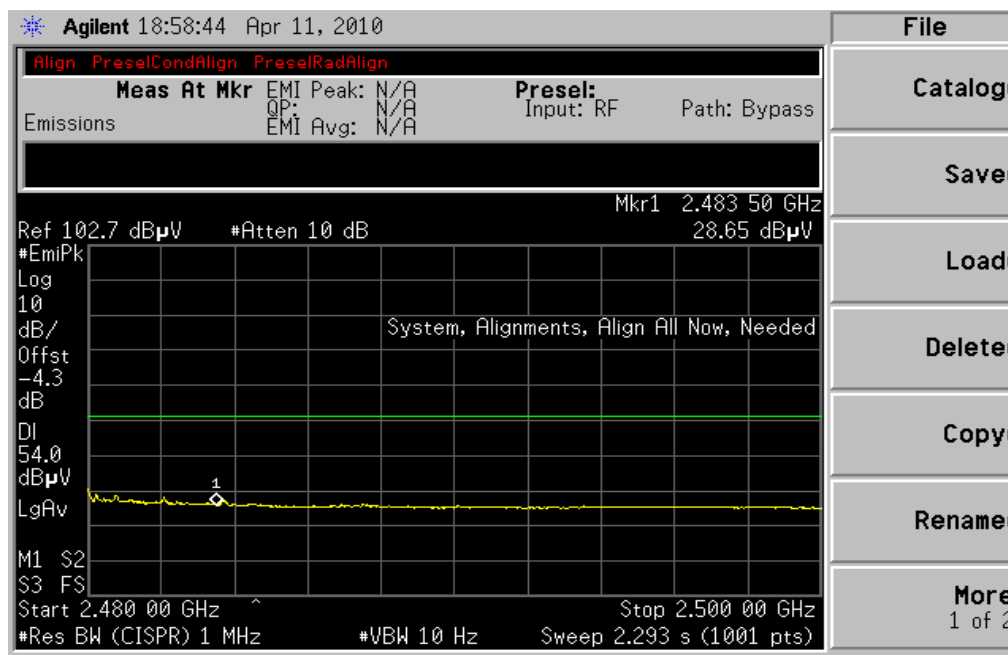
Plot 1: Restricted band low, antenna vertical/horizontal (2300 MHz – 2390 MHz)



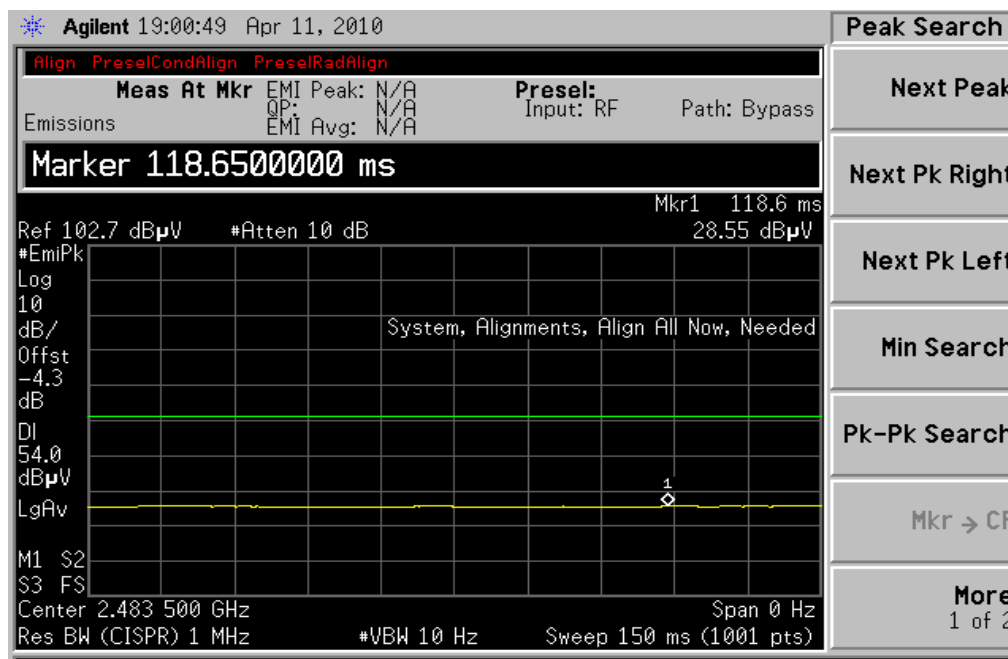
Plot 2: Band edge (2390 MHz)



Plot 3: Restricted band high, antenna vertical/horizontal (2483.5 MHz – 2500 MHz)

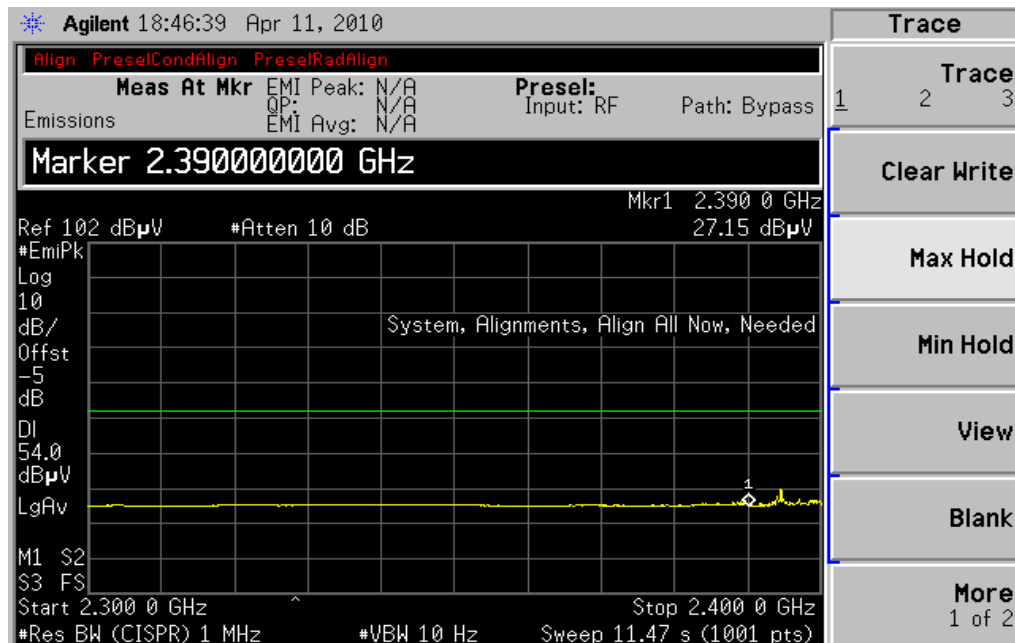


Plot 4: Band edge (2483.5 MHz)

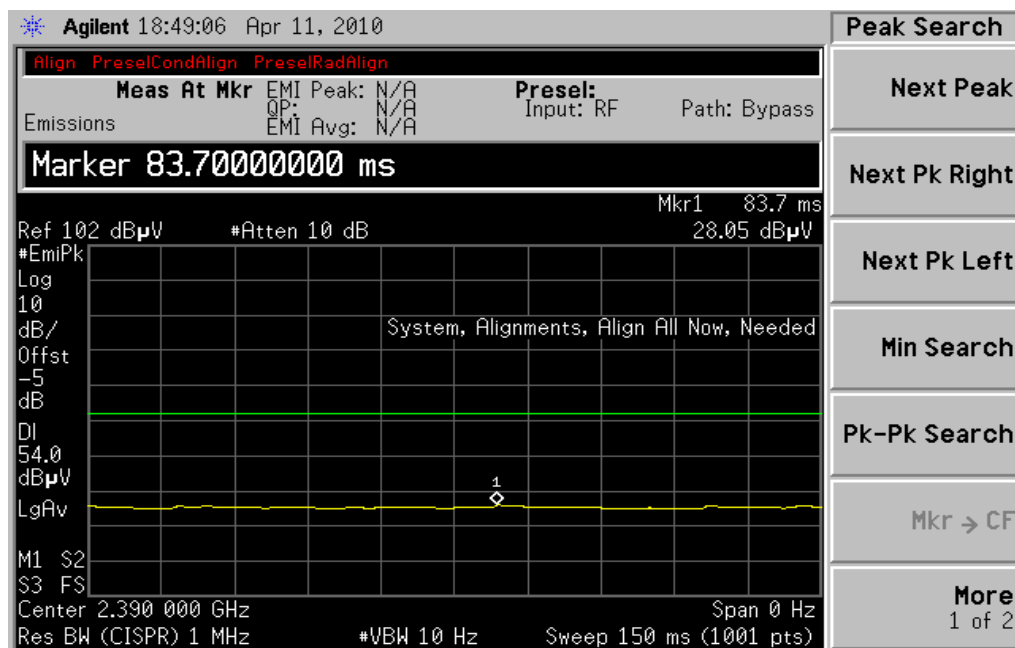


OFDM (G - Mode)

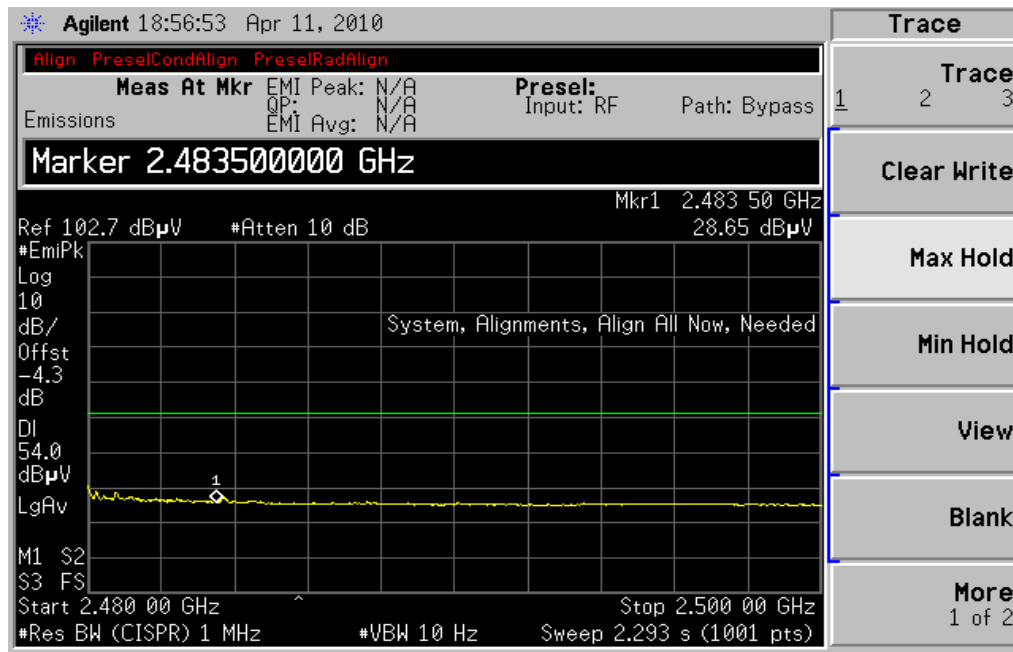
Plot 5: Restricted band low, antenna vertical/horizontal (2300 MHz – 2390 MHz)



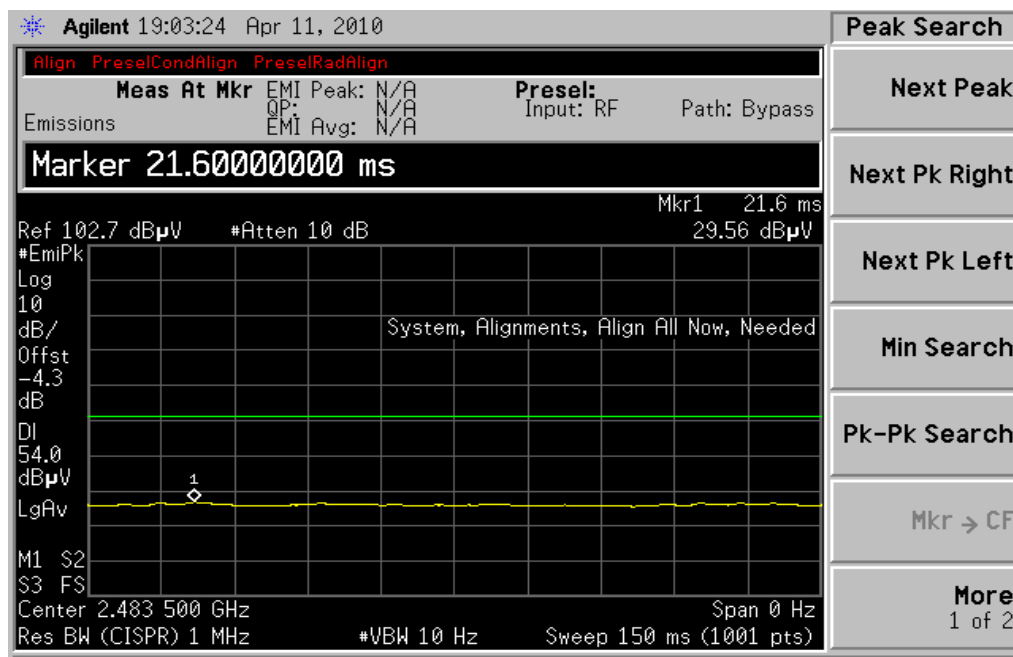
Plot 6: Band edge (2390 MHz)



Plot 7: Restricted band high, antenna vertical/horizontal (2483.5 MHz – 2500 MHz)

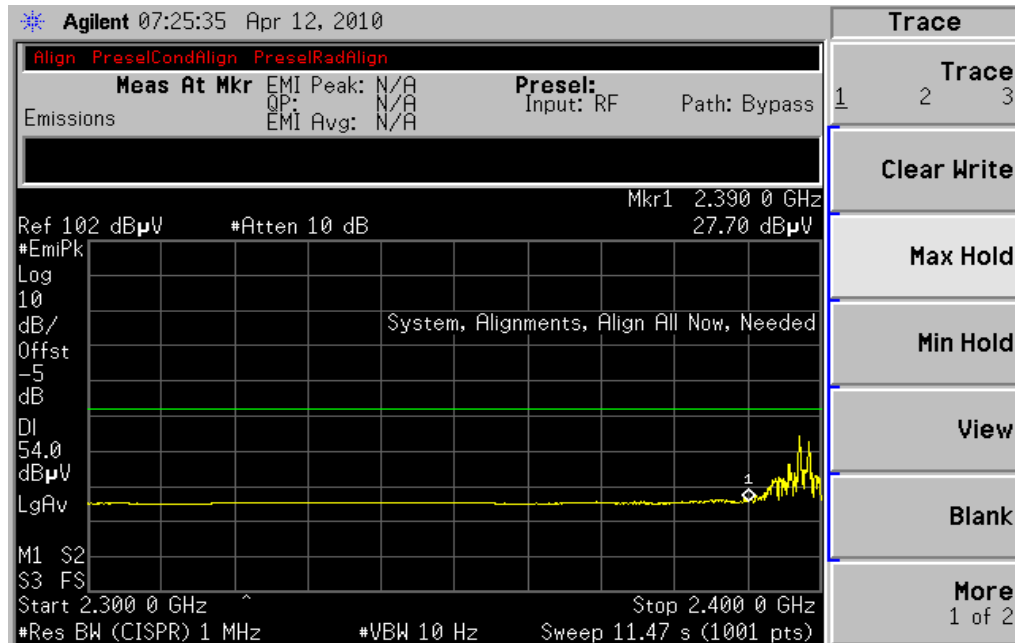


Plot 8: Band edge (2483.5 MHz)

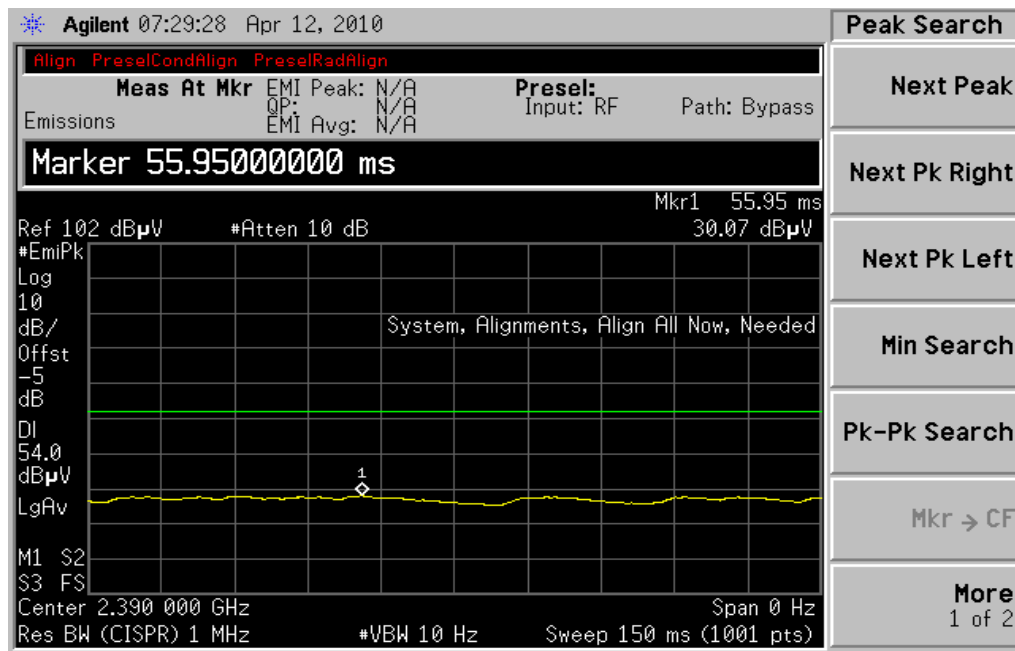


OFDM (N - Mode)

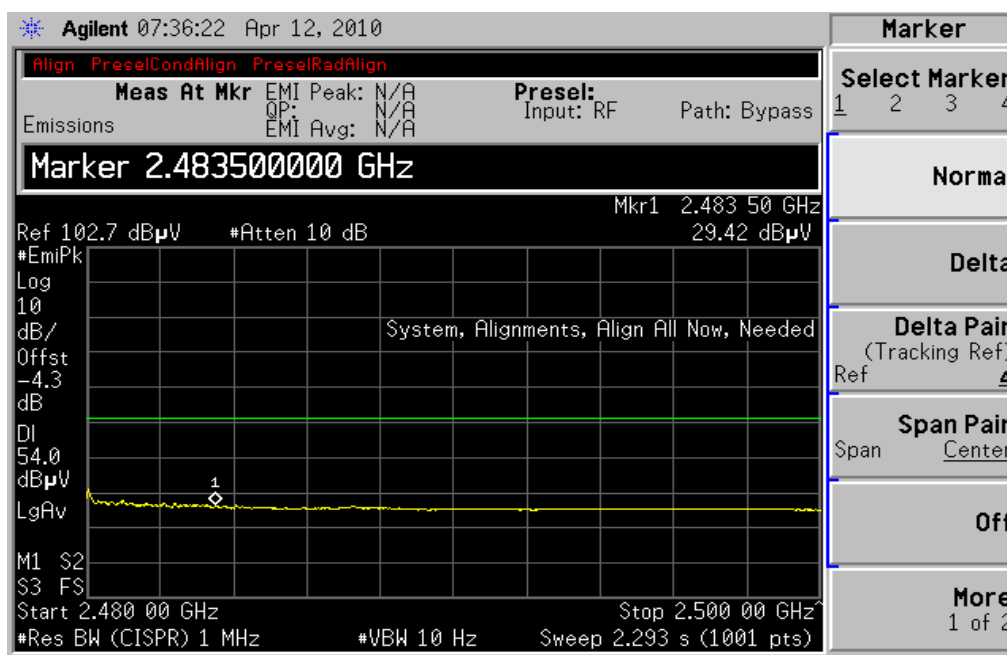
Plot 9: Restricted band low, antenna vertical/horizontal (2300 MHz – 2390 MHz)



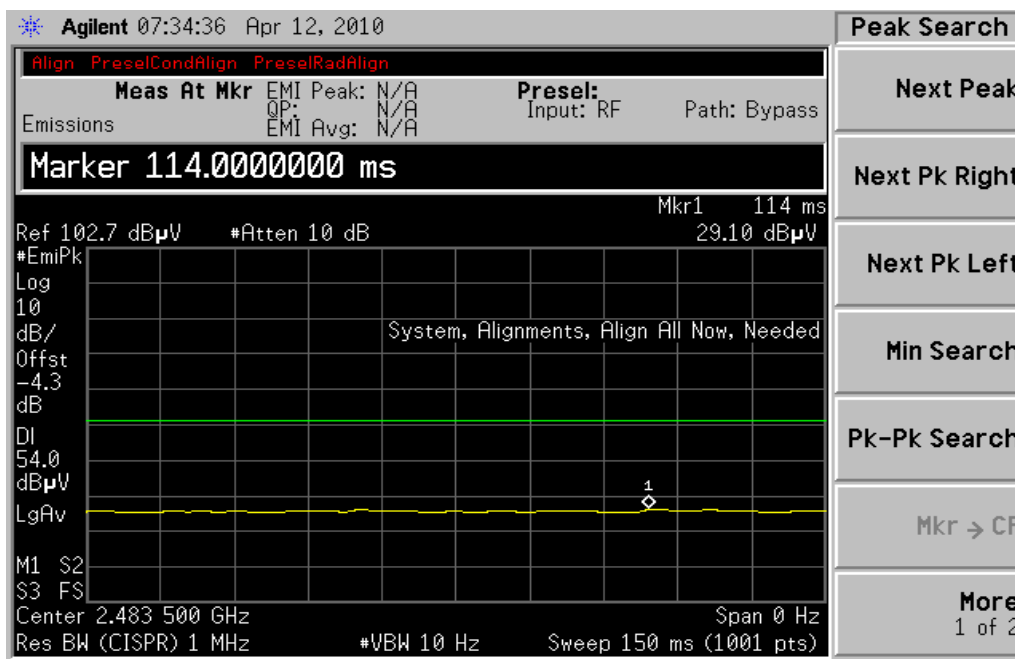
Plot 10: Band edge (2390 MHz)



Plot 11: Restricted band high, antenna vertical/horizontal (2483.5 MHz – 2500 MHz)



Plot 12: Band edge (2483.5 MHz)



5.12 Spurious Emissions - conducted (Transmitter) §15.247 (c)

Not performed!

Under normal test conditions only	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)).
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5.13 Spurious Emissions - radiated (Transmitter) §15.209

DSSS: B – Mode:

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

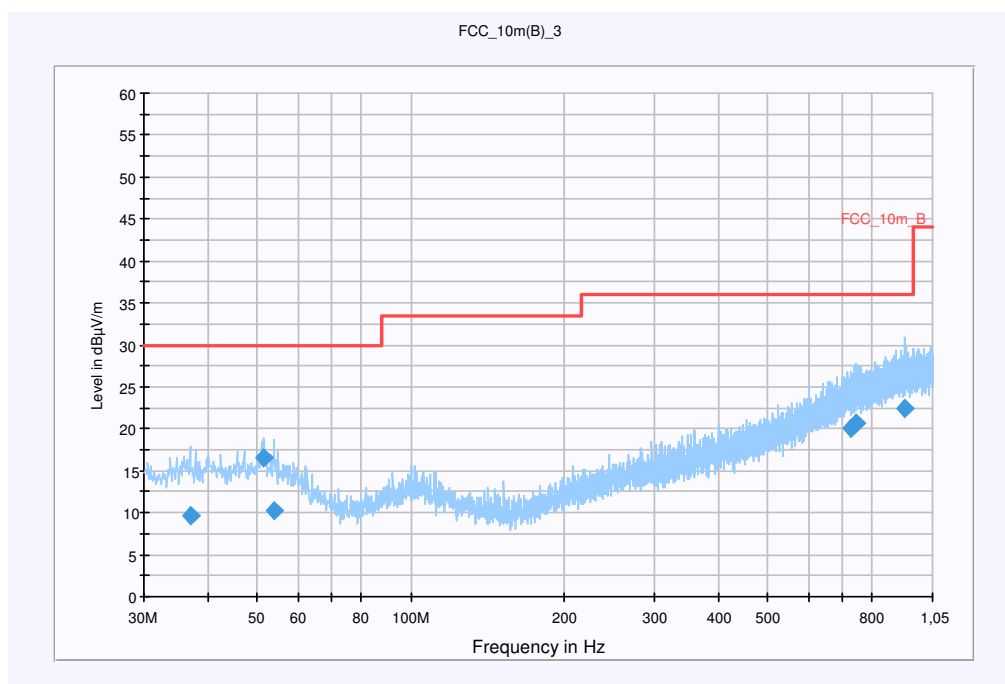
Information:

EUT:	RCW41GW
Serial Number:	IMEI: 004401.13.588929.9
Test Description:	FCC part 15 C class B
Operating Conditions:	WLAN - Low Channel, B - Mode, ping
Operator Name:	STP
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

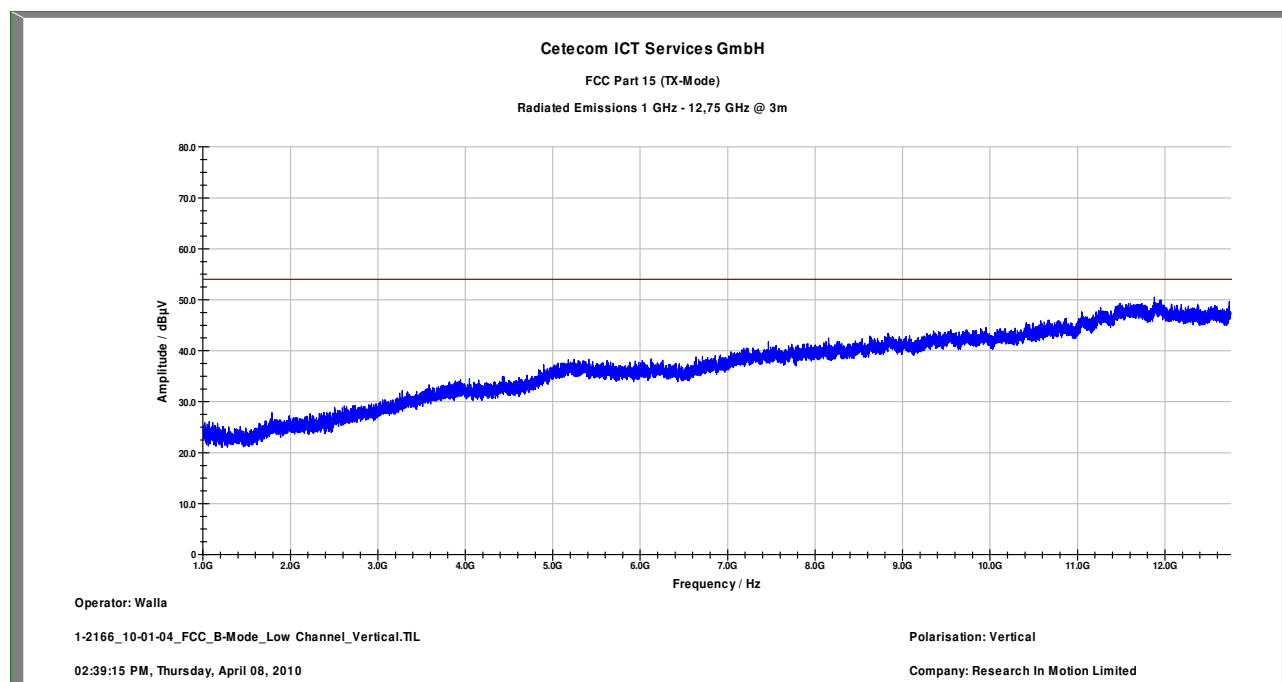
Hardware Setup:	Electric Field (NOS)
Level Unit:	dBμV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



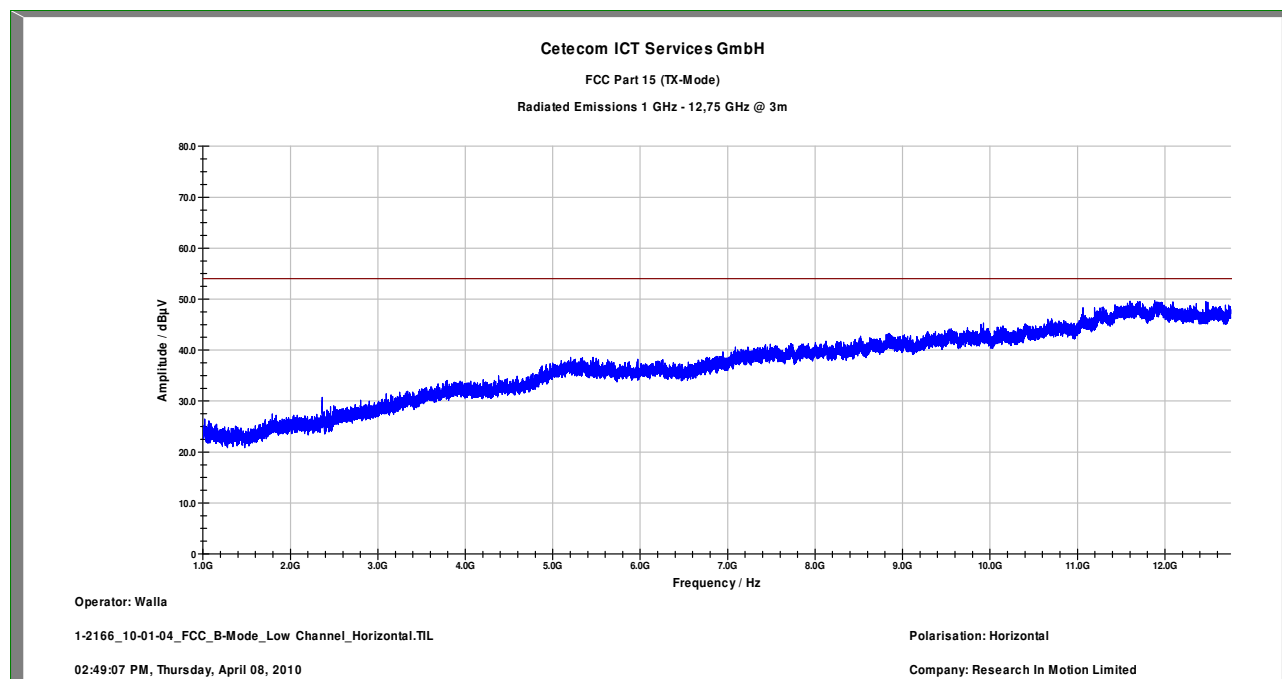
Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
37.156500	9.6	15000.000	120.000	220.0	H	280.0	13.2	20.4	30.0
51.596400	16.5	15000.000	120.000	117.0	V	226.0	13.2	13.5	30.0
53.826300	10.1	15000.000	120.000	134.0	V	62.0	13.0	19.9	30.0
724.353900	20.1	15000.000	120.000	129.0	V	275.0	23.0	15.9	36.0
742.920000	20.6	15000.000	120.000	220.0	H	106.0	23.4	15.4	36.0
922.854300	22.5	15000.000	120.000	129.0	V	14.0	25.3	13.5	36.0

Plot 2: 1 – 12.75 GHz, antenna vertical (lowest channel)



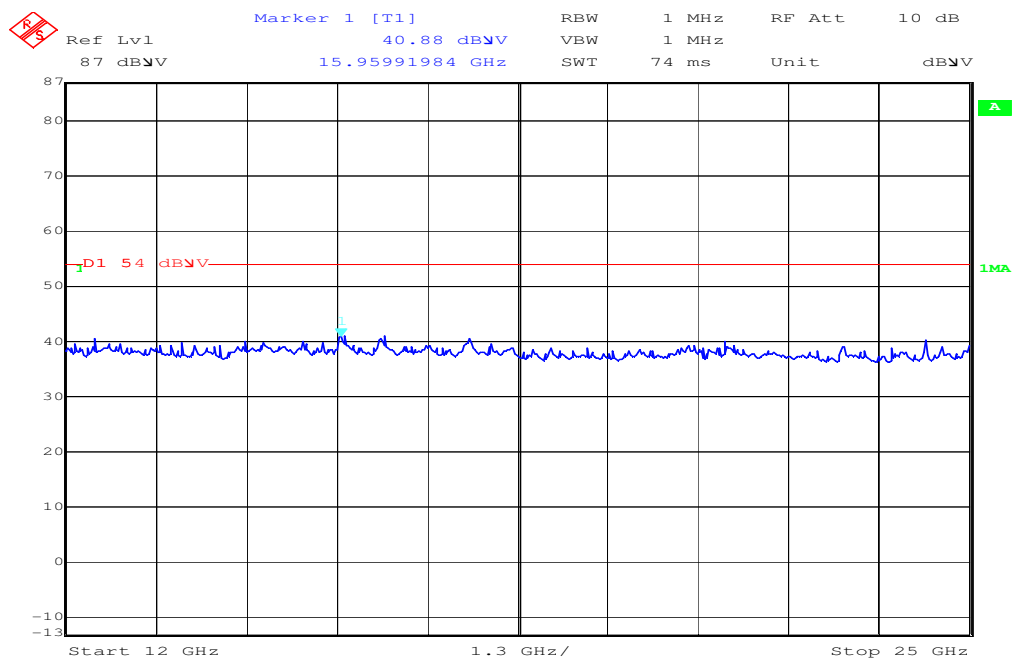
Carrier suppressed with a rejection filter.

Plot 3: 1 – 12.75 GHz, antenna horizontal (lowest channel)



Carrier suppressed with a rejection filter.

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



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

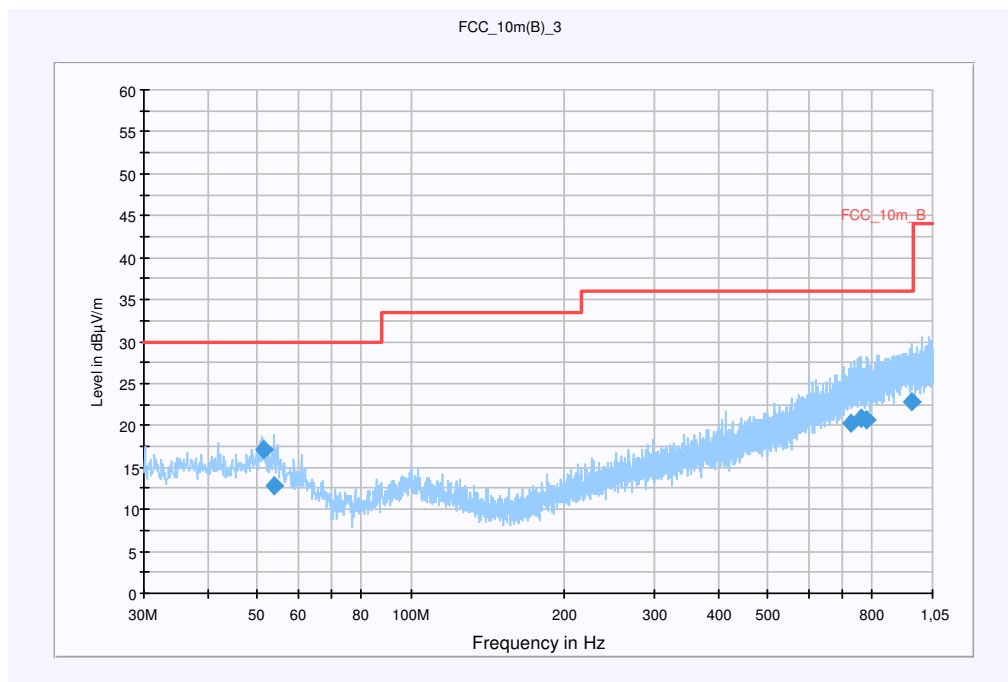
Information:

EUT:	RCW41GW
Serial Number:	IMEI: 004401.13.588929.9
Test Description:	FCC part 15 C class B
Operating Conditions:	WLAN - Middle Channel, B - Mode, ping
Operator Name:	STP
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

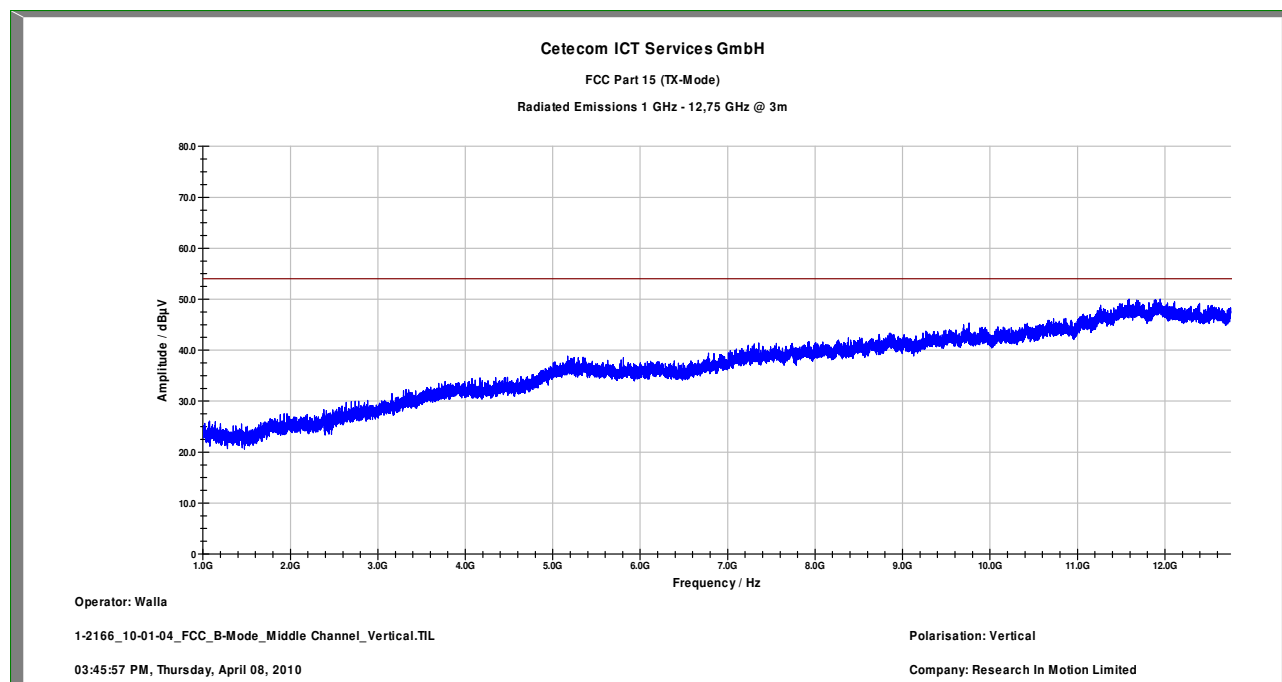
Hardware Setup:	Electric Field (NOS)
Level Unit:	dBμV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



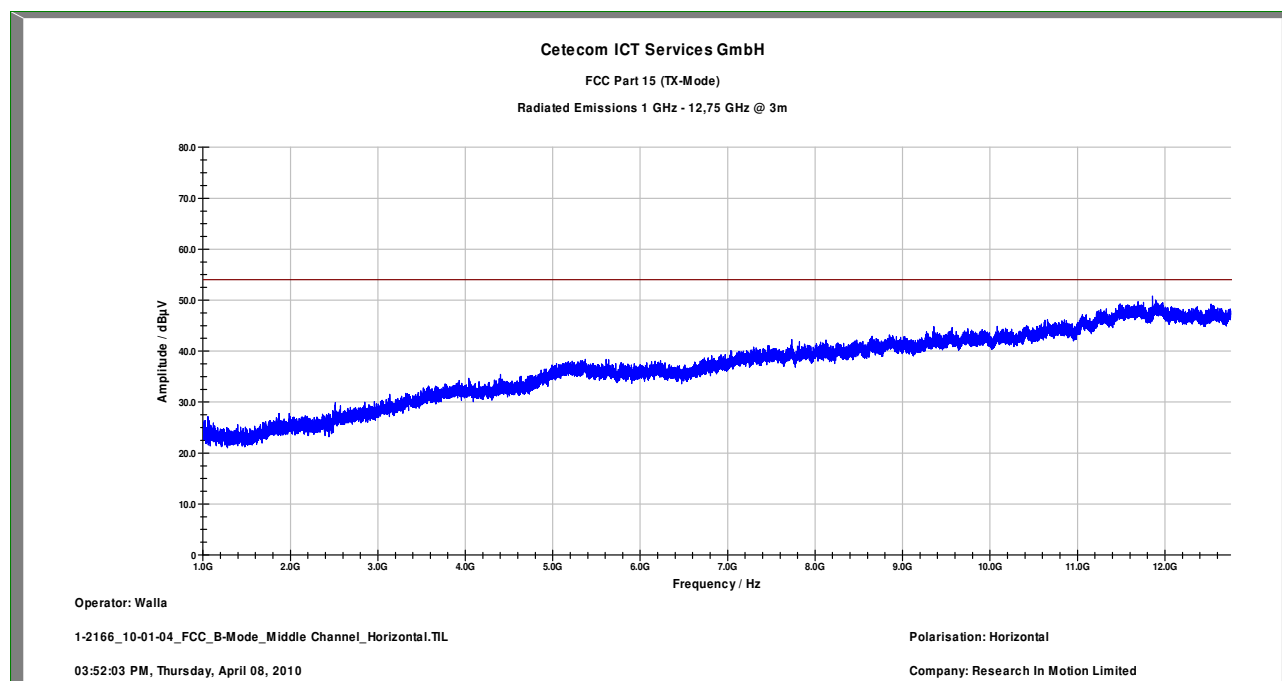
Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
51.600450	17.1	15000.000	120.000	98.0	V	292.0	13.2	12.9	30.0
53.947950	12.9	15000.000	120.000	117.0	V	235.0	13.0	17.1	30.0
728.019300	20.3	15000.000	120.000	220.0	V	223.0	23.1	15.7	36.0
762.201750	20.8	15000.000	120.000	220.0	V	324.0	23.7	15.2	36.0
778.769100	20.7	15000.000	120.000	166.0	H	316.0	23.7	15.3	36.0
958.366500	22.7	15000.000	120.000	182.0	V	-7.0	25.4	13.3	36.0

Plot 6: 1 – 12.75 GHz, antenna vertical (middle channel)



Carrier suppressed with a rejection filter.

Plot 7: 1 – 12.75 GHz, antenna horizontal (middle channel)



Carrier suppressed with a rejection filter.

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

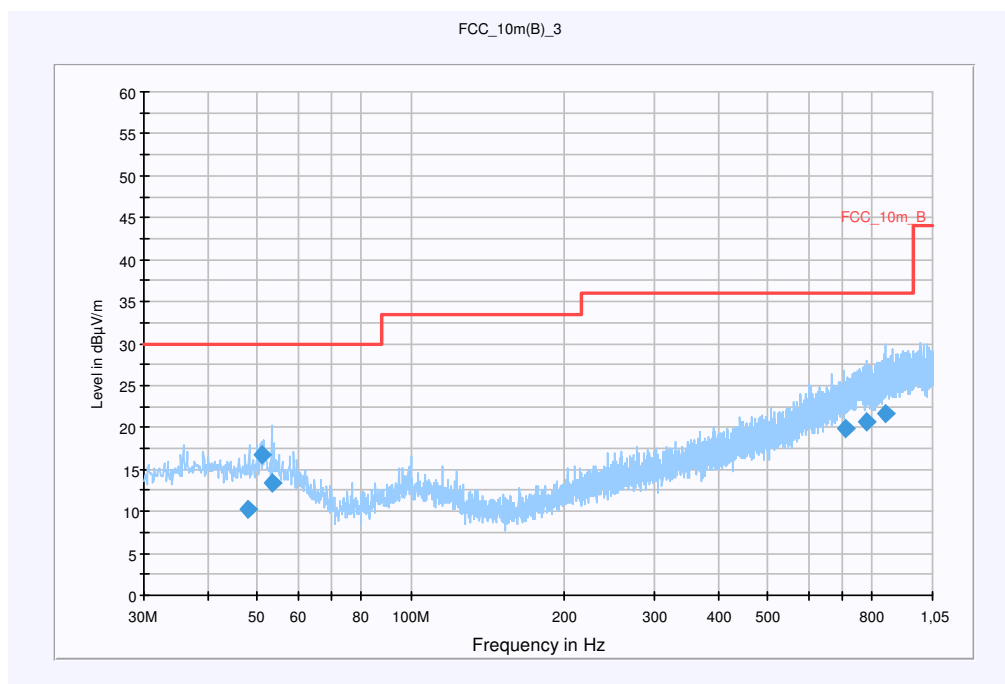
Information:

EUT:	RCW41GW
Serial Number:	IMEI: 004401.13.588929.9
Test Description:	FCC part 15 C class B
Operating Conditions:	WLAN - High Channel, B - Mode, ping
Operator Name:	STP
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

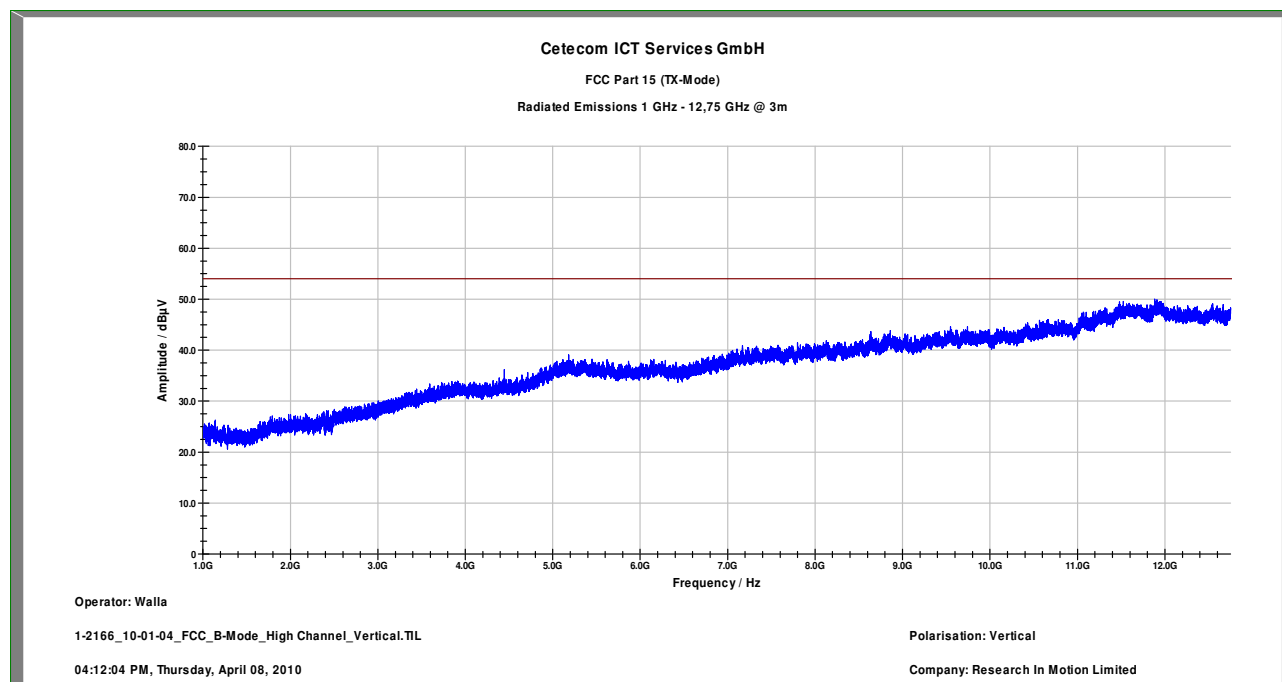
Hardware Setup:	Electric Field (NOS)
Level Unit:	dBμV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



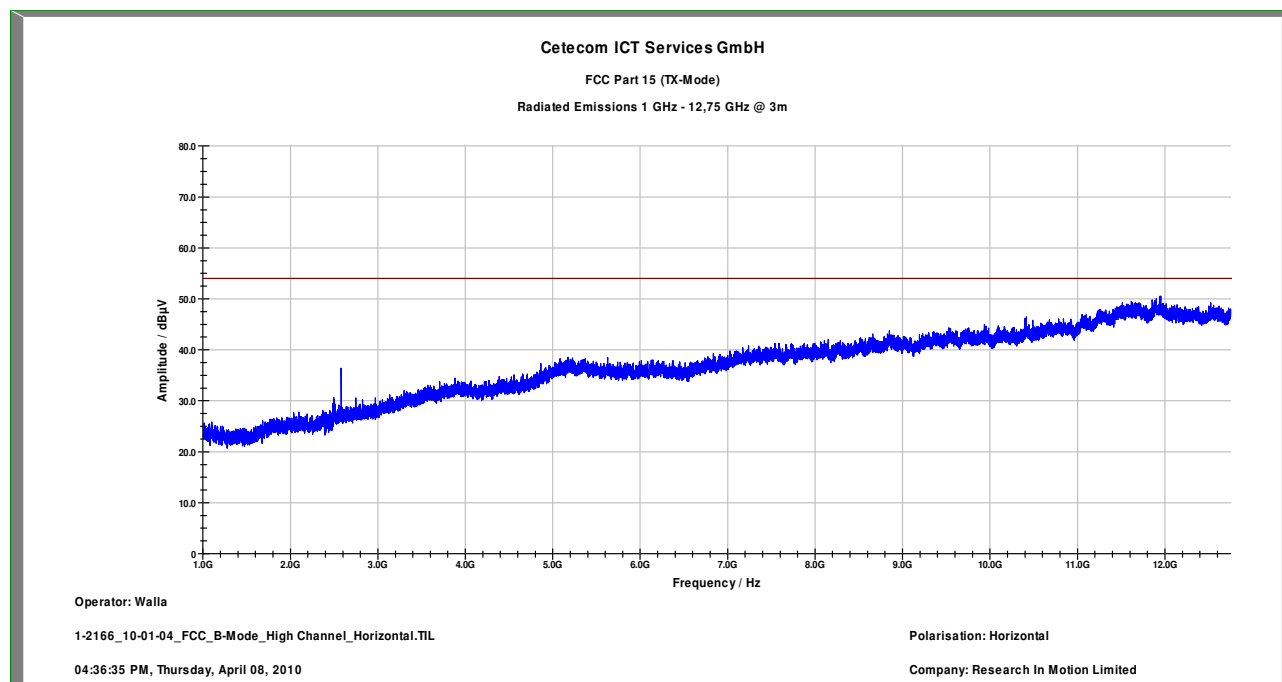
Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
47.868000	10.2	15000.000	120.000	135.0	V	240.0	13.3	19.8	30.0
50.979150	16.6	15000.000	120.000	98.0	V	235.0	13.3	13.4	30.0
53.462850	13.5	15000.000	120.000	123.0	V	173.0	13.0	16.5	30.0
707.078100	19.8	15000.000	120.000	220.0	H	146.0	22.6	16.2	36.0
776.887200	20.7	15000.000	120.000	220.0	H	240.0	23.7	15.3	36.0
849.247800	21.7	15000.000	120.000	154.0	H	38.0	24.5	14.3	36.0

Plot 9: 1 – 12.75 GHz, antenna vertical (highest channel)



Carrier suppressed with a rejection filter.

Plot 10: 1 – 12.75 GHz, antenna horizontal (highest channel)



Carrier suppressed with a rejection filter.

OFDM: N – Mode

Plot 11: 0.03 - 1 GHz (lowest channel) vertical & horizontal polarization

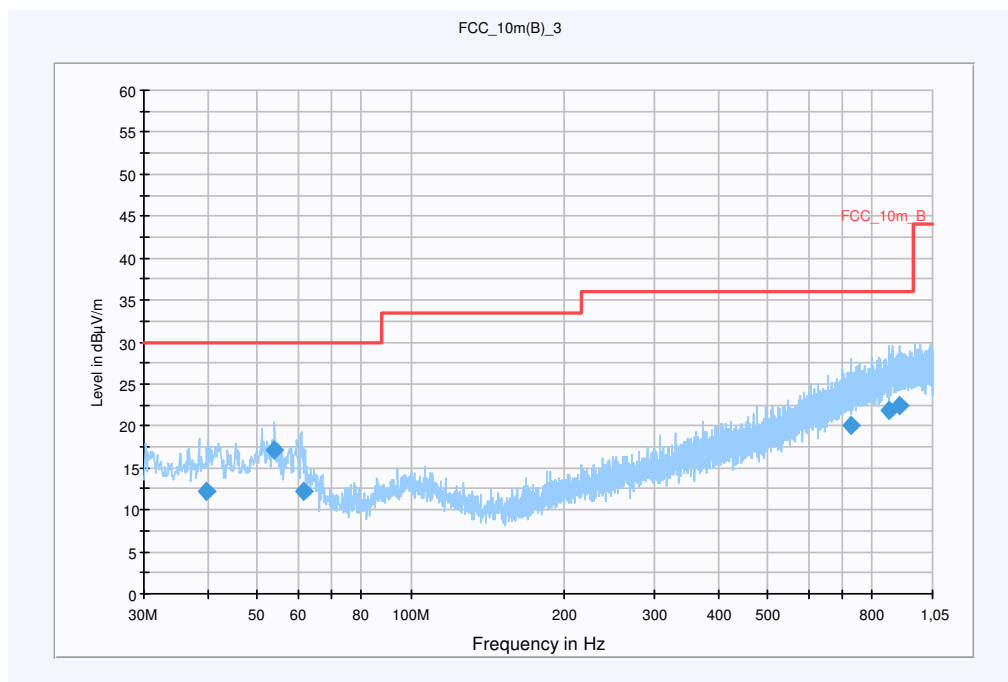
Information:

EUT:	RCW41GW
Serial Number:	IMEI: 004401.13.588929.9
Test Description:	FCC part 15 C class B
Operating Conditions:	WLAN - Low Channel, N - Mode, ping
Operator Name:	Lang
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

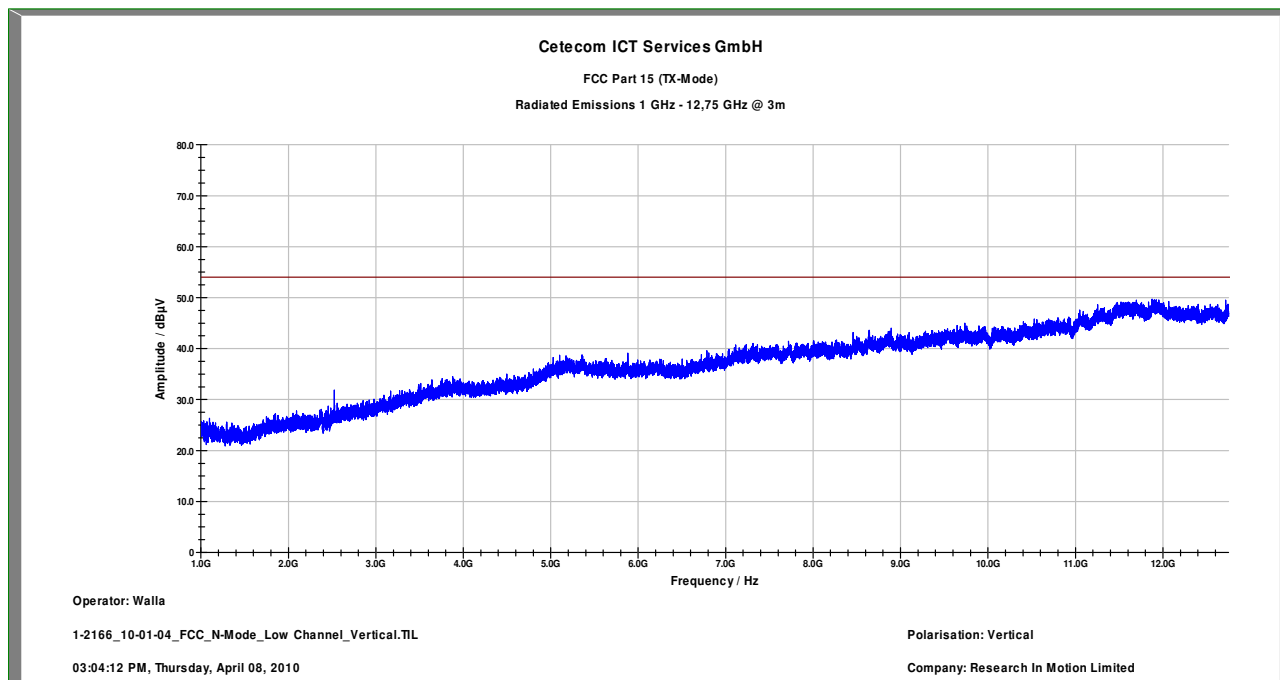
Hardware Setup:	Electric Field (NOS)
Level Unit:	dBμV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



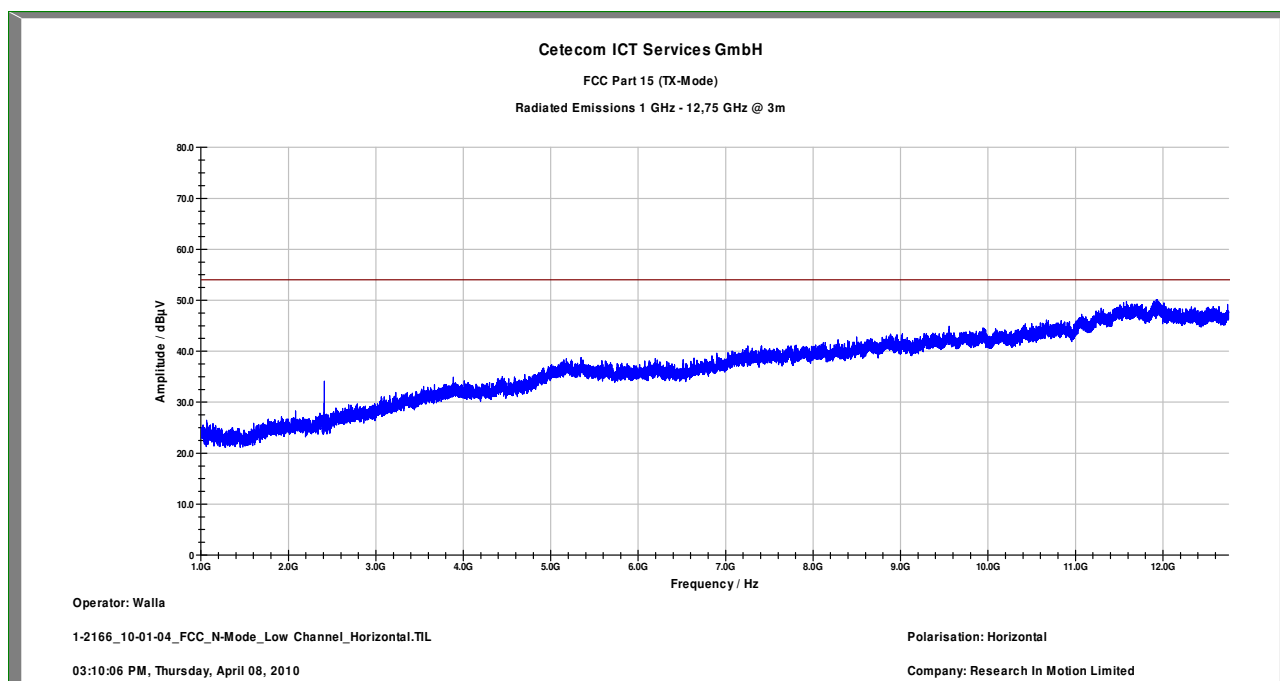
Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
39.620850	12.2	15000.000	120.000	98.0	V	162.0	13.4	17.8	30.0
54.012000	17.1	15000.000	120.000	98.0	V	201.0	13.0	12.9	30.0
61.694100	12.3	15000.000	120.000	115.0	V	179.0	11.2	17.7	30.0
725.490000	20.2	15000.000	120.000	220.0	V	217.0	23.0	15.8	36.0
861.464100	21.8	15000.000	120.000	191.0	V	7.0	24.7	14.2	36.0
901.353450	22.4	15000.000	120.000	131.0	V	316.0	25.2	13.6	36.0

Plot 12: 1 – 12.75 GHz, antenna vertical (lowest channel)



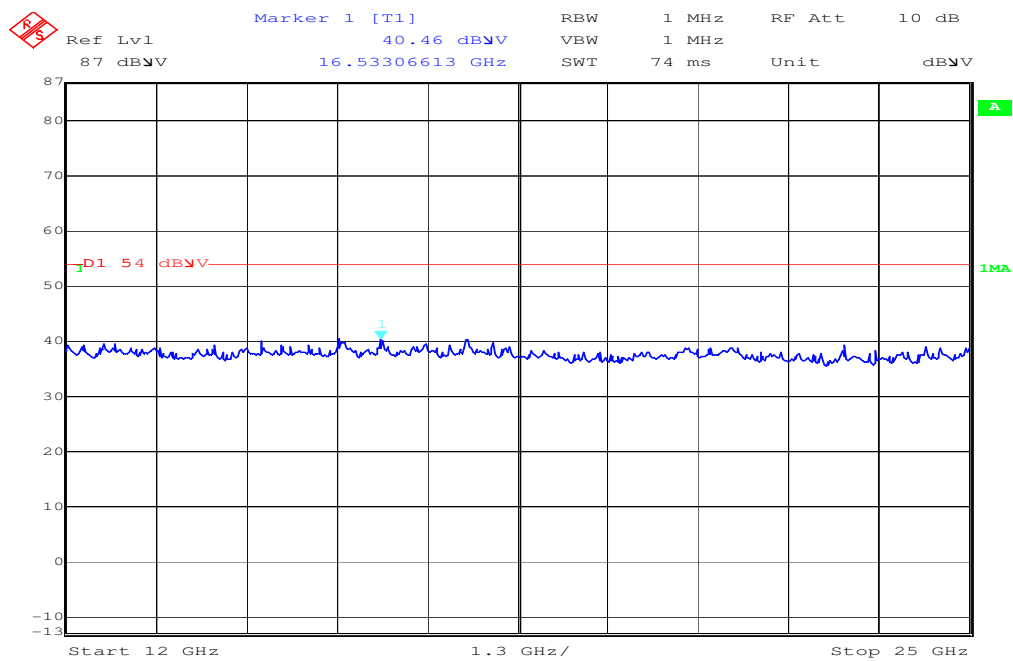
Carrier suppressed with a rejection filter.

Plot 13: 1 – 12.75 GHz, antenna horizontal (lowest channel)



Carrier suppressed with a rejection filter.

Plot 14: 12 - 25 GHz, antenna vertical/horizontal (valid for all channels)



Plot 15: 0.03 - 1 GHz (middle channel), antenna vertical/horizontal

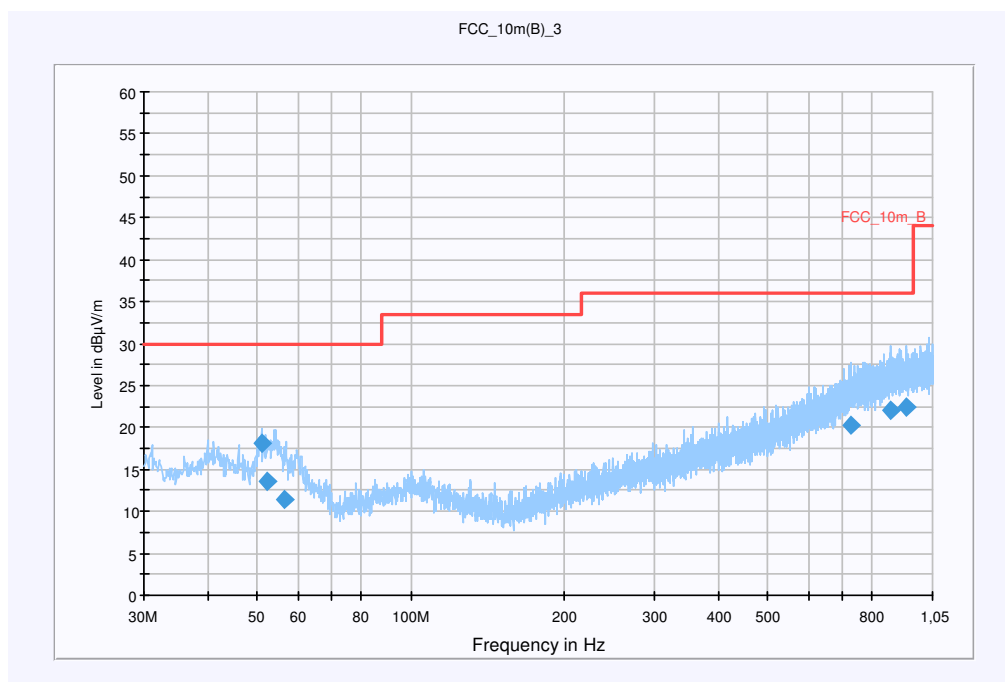
Information:

EUT:	RCW41GW
Serial Number:	IMEI: 004401.13.588929.9
Test Description:	FCC part 15 C class B
Operating Conditions:	WLAN - Low Channel, N - Mode, ping
Operator Name:	Lang
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

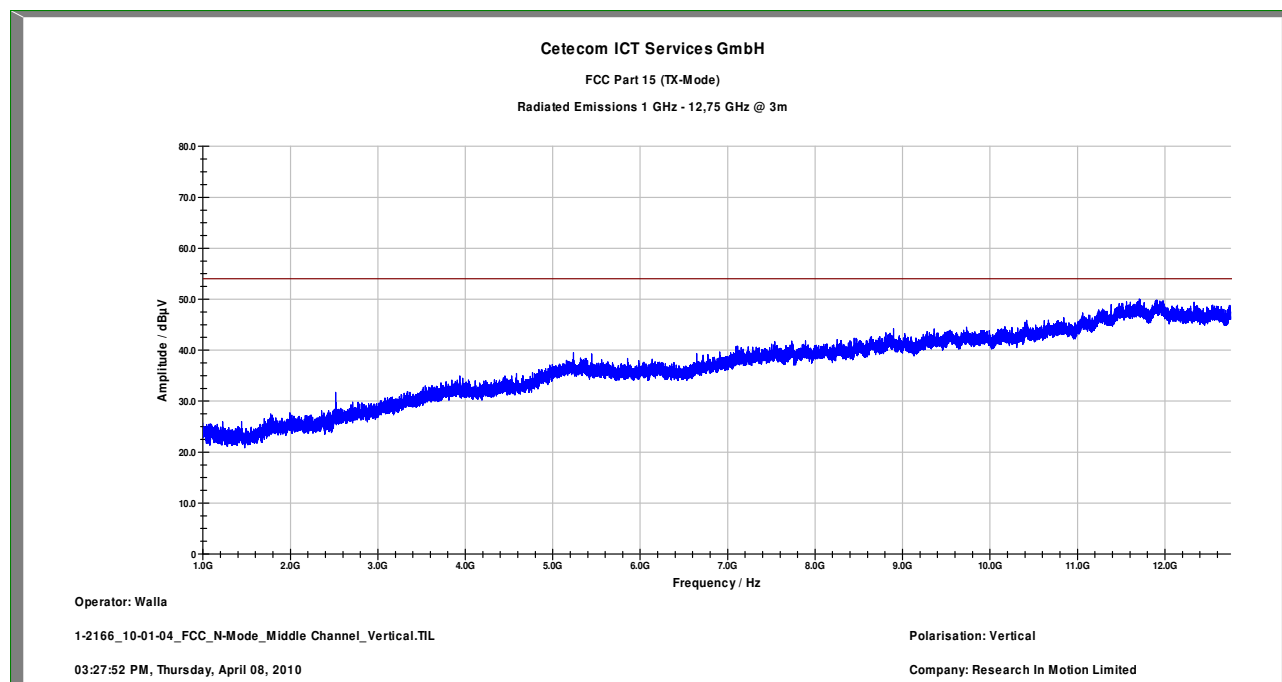
Hardware Setup:	Electric Field (NOS)
Level Unit:	dBμV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



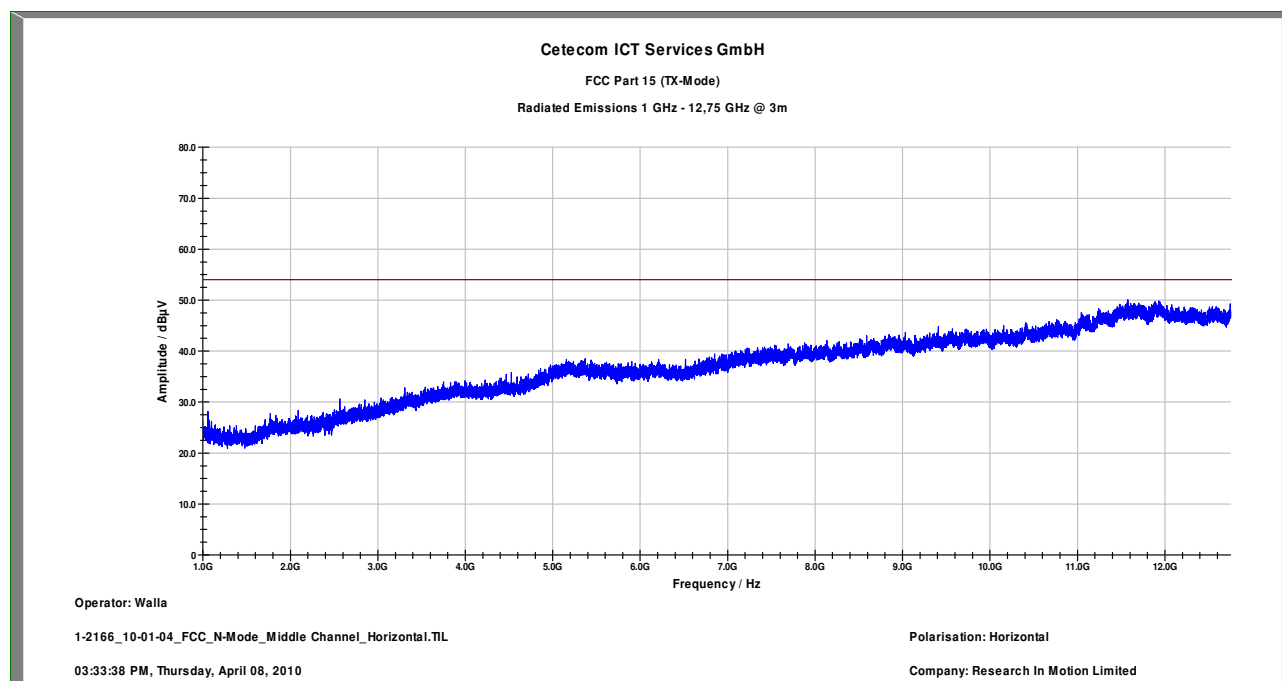
Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
51.021000	18.1	15000.000	120.000	98.0	V	235.0	13.3	11.9	30.0
52.468350	13.5	15000.000	120.000	120.0	V	235.0	13.1	16.5	30.0
56.746950	11.3	15000.000	120.000	98.0	V	13.0	12.4	18.7	30.0
729.427350	20.3	15000.000	120.000	214.0	V	52.0	23.1	15.7	36.0
867.721200	22.0	15000.000	120.000	220.0	V	278.0	24.8	14.0	36.0
934.900500	22.5	15000.000	120.000	220.0	V	207.0	25.3	13.5	36.0

Plot 16: 1 – 12.75 GHz, antenna vertical (middle channel)



Carrier suppressed with a rejection filter.

Plot 17: 1 – 12.75 GHz, antenna horizontal (middle channel)



Carrier suppressed with a rejection filter.

Plot 18: 0.03 - 1 GHz (highest channel) vertical & horizontal polarization

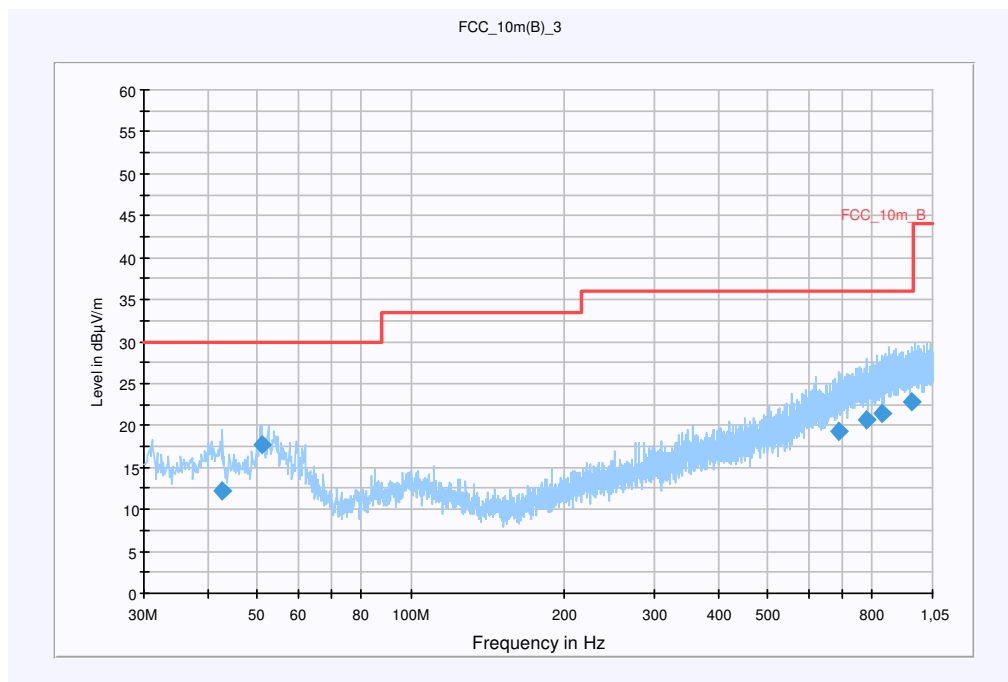
Information:

EUT:	RCW41GW
Serial Number:	IMEI: 004401.13.588929.9
Test Description:	FCC part 15 C class B
Operating Conditions:	WLAN - High Channel, N - Mode, ping
Operator Name:	Lang
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

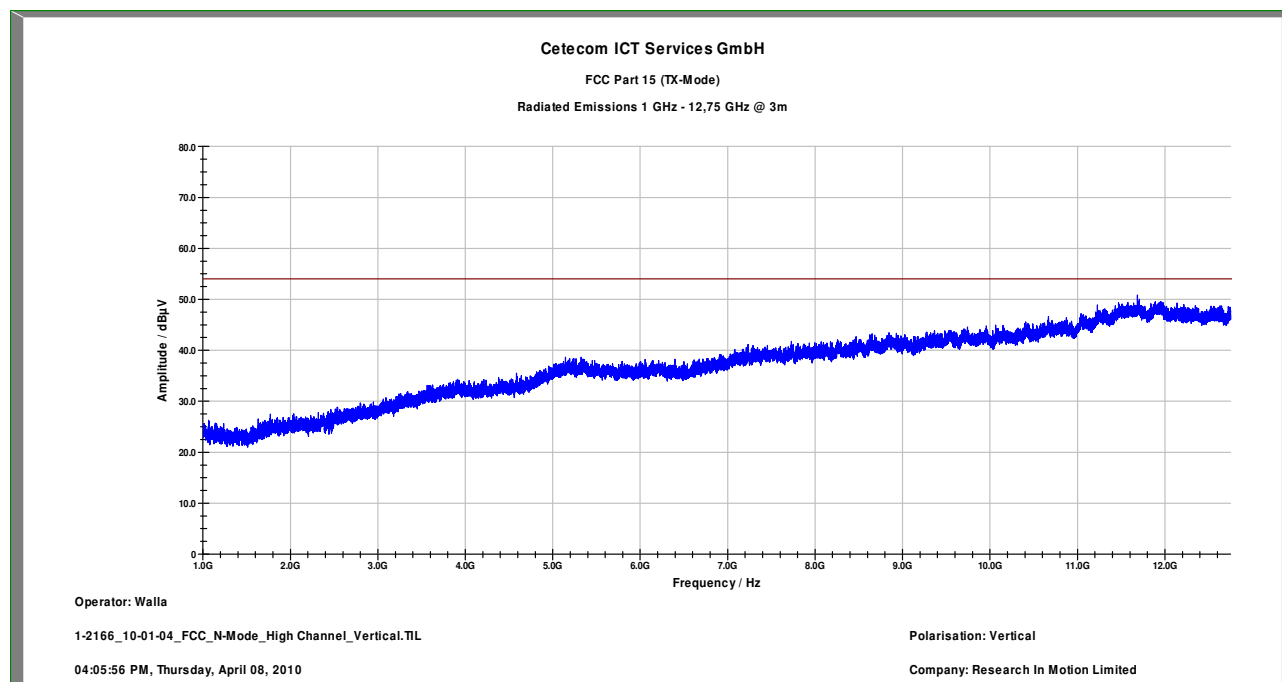
Hardware Setup:	Electric Field (NOS)
Level Unit:	dBμV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



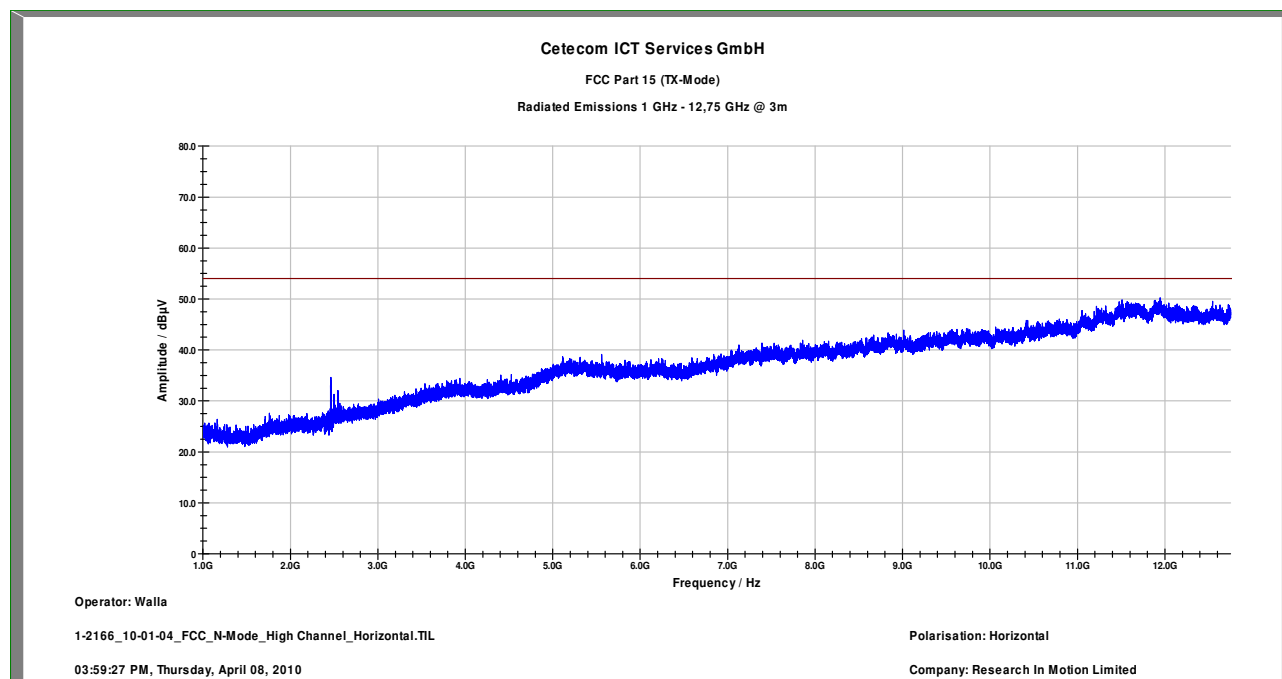
Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
42.531150	12.3	15000.000	120.000	157.0	V	262.0	13.3	17.7	30.0
51.016350	17.7	15000.000	120.000	124.0	V	264.0	13.3	12.3	30.0
686.407350	19.2	15000.000	120.000	206.0	H	42.0	22.0	16.8	36.0
778.337850	20.7	15000.000	120.000	220.0	V	282.0	23.7	15.3	36.0
833.515050	21.4	15000.000	120.000	176.0	H	70.0	24.3	14.6	36.0
957.979950	22.8	15000.000	120.000	220.0	V	75.0	25.4	13.2	36.0

Plot 19: 1 – 12.75 GHz, antenna vertical (highest channel)



Carrier suppressed with a rejection filter.

Plot 20: 1 – 12.75 GHz, antenna horizontal (highest channel)



Carrier suppressed with a rejection filter.

Results: B-Mode

SPURIOUS EMISSIONS LEVEL §15.209								
2412 MHz			2437 MHz			2462 MHz		
Frequency [MHz]	Detector	Level [dBμV/m]	Frequency [MHz]	Detector	Level [dBμV/m]	Frequency [MHz]	Detector	Level [dBμV/m]
No critical peaks detected!								
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz

f ≥ 1GHz : RBW/VBW: 1 MHz

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:

§ 15.109

Frequency (MHz)	Field strength (dBμV/m)	Measurement distance (m)
30 - 88	30.0	10
88 - 216	33.5	10
216 - 960	36.0	10
above 960	54.0	3

Results: N-Mode

SPURIOUS EMISSIONS LEVEL §15.209								
2412 MHz			2437 MHz			2462 MHz		
Frequency [MHz]	Detector	Level [dBμV/m]	Frequency [MHz]	Detector	Level [dBμV/m]	Frequency [MHz]	Detector	Level [dBμV/m]
No critical peaks detected!								
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz

f ≥ 1GHz : RBW/VBW: 1 MHz

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:

§ 15.109

Frequency (MHz)	Field strength (dBμV/m)	Measurement distance (m)
30 - 88	30.0	10
88 - 216	33.5	10
216 - 960	36.0	10
above 960	54.0	3

5.14 Spurious Emissions - radiated (Receiver) §15.109 / 209

Plot 21: 0.03 - 1 GHz, antenna vertical/horizontal polarization (receiver)

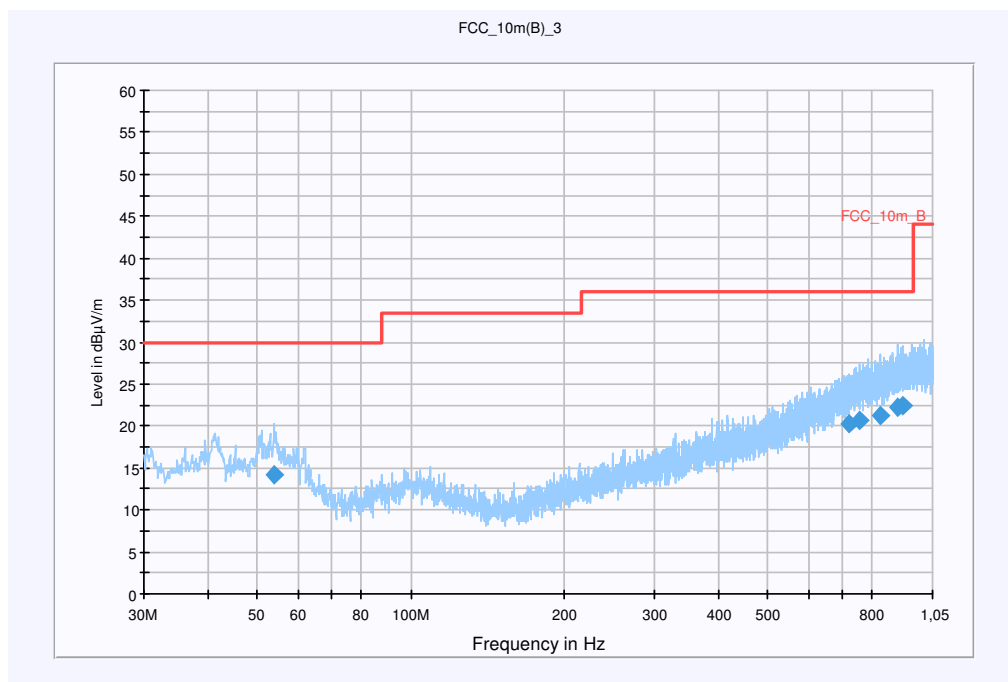
Information:

EUT:	RCW41GW
Serial Number:	IMEI: 004401.13.588929.9
Test Description:	FCC part 15 C class B
Operating Conditions:	WLAN – RX-Mode
Operator Name:	Lang
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

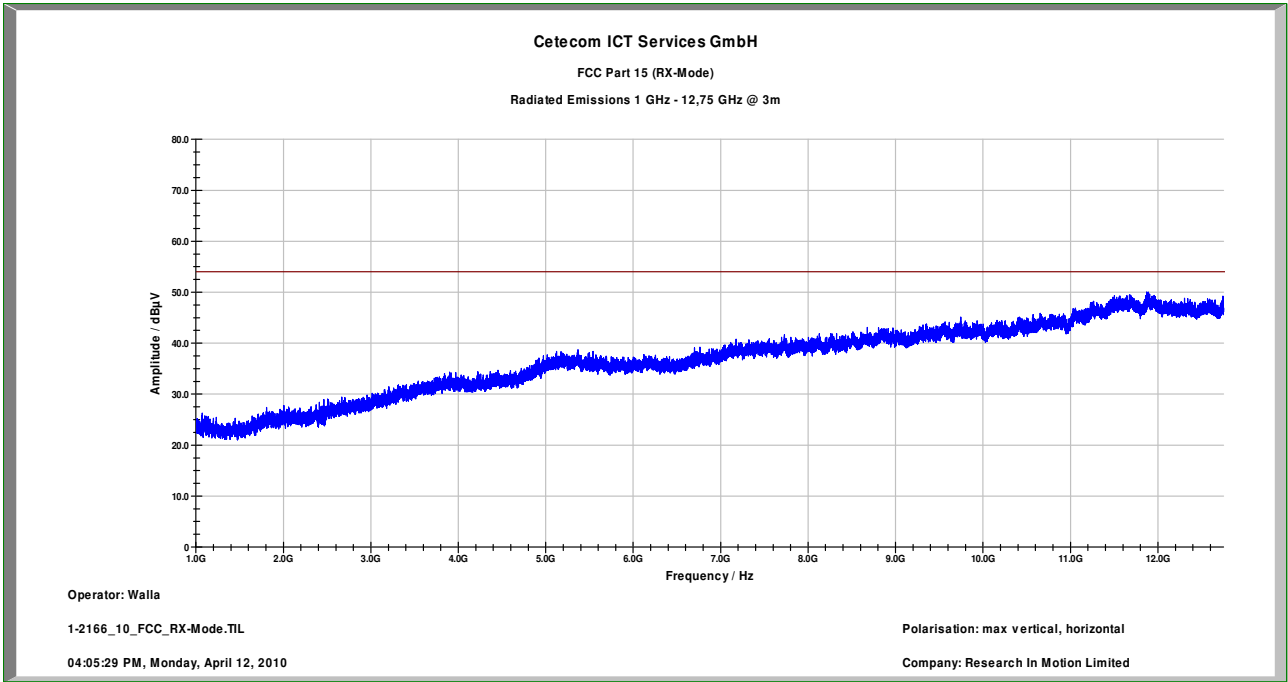
Hardware Setup:	Electric Field (NOS)
Level Unit:	dB μ V/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver

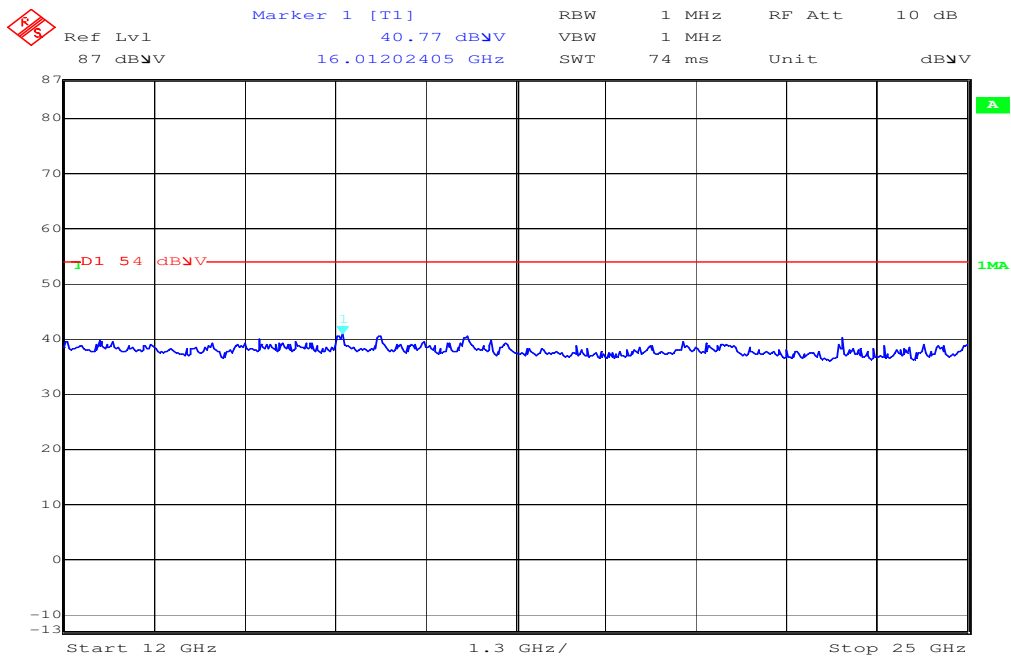


Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
54.031800	14.1	15000.000	120.000	137.0	V	98.0	13.0	15.9	30.0
720.718350	20.2	15000.000	120.000	160.0	V	105.0	22.9	15.8	36.0
757.096200	20.7	15000.000	120.000	182.0	V	25.0	23.6	15.3	36.0
829.339350	21.3	15000.000	120.000	220.0	V	246.0	24.2	14.7	36.0
896.443500	22.3	15000.000	120.000	98.0	H	298.0	25.2	13.7	36.0
917.529150	22.5	15000.000	120.000	174.0	H	257.0	25.3	13.5	36.0

Plot 22: 1 – 12.75 GHz, antenna vertical/horizontal (receiver)



Plot 23: 12 - 25 GHz, antenna vertical/horizontal polarization (receiver)



Results:

Spurious Emissions level [dB μ V/m]		
Frequency [MHz]	Detector	Level [dB μ V/m]
No critical peaks detected!		
Measurement uncertainty		± 3 dB

f < 1 GHz : RBW/VBW: 100 kHz

f $\geq$ 1GHz : RBW/VBW: 1 MHz

See above plots

Measurement distance see table

Limits:**§ 15.109**

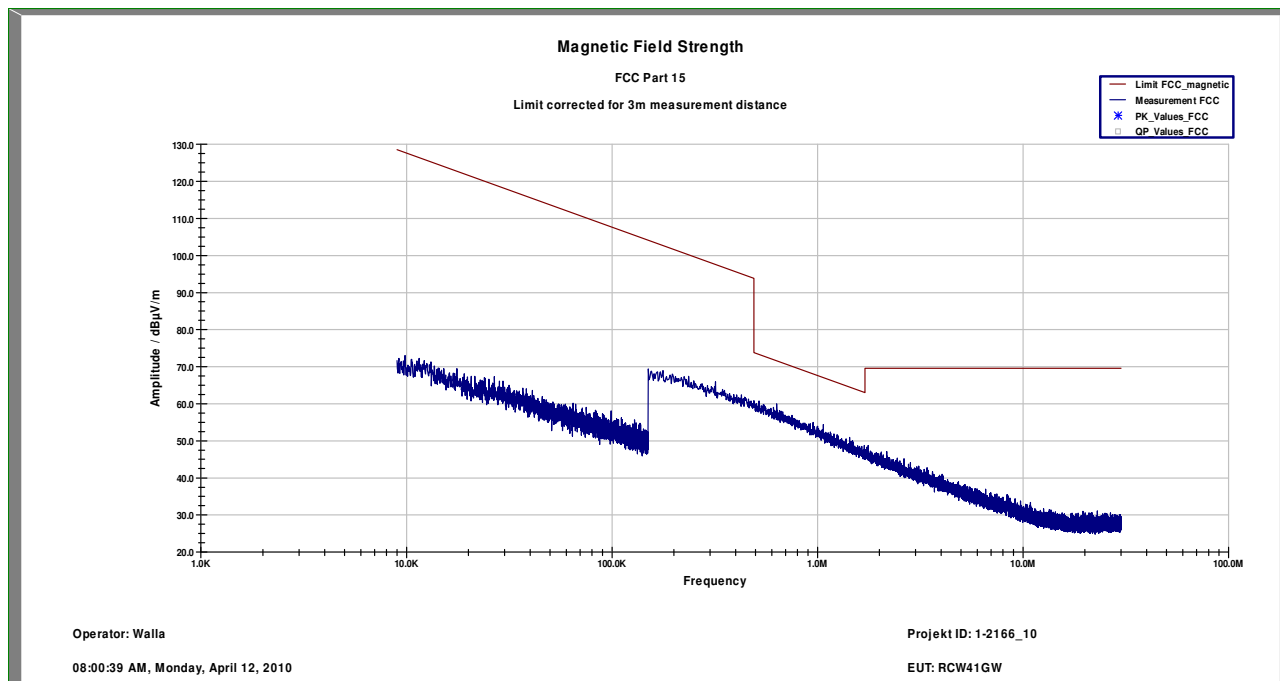
Frequency (MHz)	Field strength (dB μ V/m)	Measurement distance (m)
30 - 88	30.0	10
88 - 216	33.5	10
216 - 960	36.0	10
above 960	54.0	3

5.15 Spurious Emissions - radiated <30 MHz §15.209

Measured at 3 m distance.

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

Plot 24: (valid for all channels and modes)



Limits:

Frequency (MHz)	Field strength (μV/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 dBμV/m	30
30 - 88	100 / 40 dBμV/m	3
88 - 216	150 / 43.5 dBμV/m	3
216 - 960	200 / 46 dBμV/m	3
above 960	54 dBμV/m	3

5.16 Conducted Emissions <30 MHz §15.107/207

Not performed!

Limits:

Under normal test conditions only	See plots
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6 Test equipment and ancillaries used for tests

In order to simplify the identification of the equipment used at each specific test, each item of test equipment and ancillaries are provided with an identifier or number in the equipment list below.

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, rf-generating and signalling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

No.	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Last Calibration	Next Calibration
1	System Autoranging DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	08.01.2009	08.01.2012
2	PowerAttenuator	8325	Byrd	1530	300001595		
3	Double-Ridged Waveguide Horn Antenna 1-26.5GHz	3115	EMCO	8812-3088	300001032	05.03.2009	05.03.2011
4	Active Loop Antenna	6502	EMCO	2210	300001015		
5	Anechoic chamber		MWB	87400/02	300000996		
6	System-Rack	85900	HP I.V.	*	300000222		
7	Artificial Mains 9 kHz to 30 MHz, 4 x 25 Ampere	ESH3-Z5	R&S	828576/020	300001210	06.01.2010	06.01.2012
8	Relais Matrix	3488A	HP Meßtechnik	2719A15013	300001156		
9	Relais Matrix	PSU	R&S	890167/024	300001168		
10	Isolating Transformer	RT5A	Grundig	9242	300001263		
11	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997		
12	Switch / Control Unit	3488A	HP	2605e08770	300001443		
13	Band Reject filter	WRCG1855/1910-1835/1925-40/8SS	Wainwright	7	300003350		
14	Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351		
15	TILE-Software Emission	Quantum Change, Modell TILE-ICS/FULL	EMCO	none	300003451		
16	Highpass Filter	WHKX2.9/18G-12SS	Wainwright	1	300003492		
17	Highpass Filter	WHK1.1/15G-10SS	Wainwright	3	300003255		
18	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789		
19	PSA Spectrum Analyzer 3 Hz - 26.5 GHz	E4440A	Agilent Vertr. Bad Hom	MY48250080	300003812	05.08.2008	05.08.2010
20	MXG Microwave Analog Signal Generator	N5183A	Agilent Vertr. Bad Hom	MY47420220	300003813	06.08.2008	06.08.2010
21	RF Filter Section 9kHz - 1GHz	N9039A	Agilent Vertr. Bad Hom	MY48260003	300003825	19.08.2008	19.08.2010
22	TRILOG Super Breitband Antenne	VULB9163	Schwarzbeck	371	300003854	17.12.2008	17.12.2010