CETECOM ICT Services GmbH
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RSC-Laboratory

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.	**:**	**1-2166-01-03/10 A**
Type identification	**:**	**RCW41GW**
Applicant	**:**	**Research In Motion Limited**
FCC ID	**:**	**L6A RCW40GW**
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:

2010-04-20	**Marco Bertolino**	
Date	Name	Signature

Technical responsibility for area of testing:

2010-04-20	**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:	**2010-04-09**
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	:	**OS: v5.0.0.541** **Platform: 6.1.0.5**
Frequency Band [MHz]	:	**ISM band 2.400 - 2.483,5** **(channel 00 – 2402 MHz; channel 78 – 2480 MHz)**
Type of Modulation	:	**FHSS – GFSK; Pi/4 DQPSK, 8DPSK**
Number of channels	:	**79**
Antenna	:	**Integrated PCB antenna**
Power Supply	:	**3.7 V DC supplied by Li-Ion-Battery**

Max. power radiated: **8.71 dBm**
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 (channel 00 – 2402 MHz; channel 78 – 2480 MHz)**
RF: Power [W] (max):	**GFSK modulation: Rad. EIRP: 6.90 mW Conducted : not performed Pi/4 DQPSK modulation: Rad. EIRP: 6.14 mW Conducted : not performed 8 DPSK modulation: Rad. EIRP: 7.43 mW Conducted : not performed**
Antenna Type:	**Integrated PCB antenna**
Occupied Bandwidth (99% BW) [kHz]:	**Not performed!**
Type of Modulation:	**FHSS – GFSK; Pi/4 DQPSK, 8DPSK**
Emission Designator (TRC-43):	**Not performed!**
Transmitter Spurious (worst case) [dBµV/m in 3m]:	**50.59**
Receiver Spurious (worst case) [dBµV/m in 3m]:	**50.78**

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: Marco Bertolino Date: 2010-04-20

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

All Fields must be completed with the requested information or the following codes: N/A for Not Applicable, N/P for Not Performed or N/V for Not Available. Where applicable, check appropriate box.

1. COMPANY NUMBER:	**2503A**
2. MODEL NUMBER:	**RCW41GW**
3. MANUFACTURER:	**Research In Motion Limited**
4. TYPE OF EVALUATION:	**N.A.**

Declaration of RF Exposure Compliance

ATTESTATION:

I attest that the information provided in this test report are correct; that a Technical Brief was prepared and the information it contains 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 exposure limits of RSS-102.

Name: Marco Bertolino
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 V**

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	Passed	2010-04-09	-/-

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 Pi/4 DQPSK 8 DPSK	Yes Yes Yes			
§ 15.247 (d)	Band-edge compliance of conducted emissions	GFSK Pi/4 DQPSK 8 DPSK				Yes Yes Yes
§ 15.205	Band-edge compliance of radiated emissions	GFSK Pi/4 DQPSK 8 DPSK	Yes Yes Yes			
§ 15.247 (d)	Spurious Emission - conducted (Transmitter)	GFSK				Yes
§ 15.247 (d)	Spurious Emission - radiated (Transmitter) >30 MHz	GFSK 8 DPSK	Yes Yes			
§ 15.109	Spurious Emissions - radiated (Receiver)	GFSK	Yes			
§ 15.209	Spurious Emissions - radiated (Transmitter) <30 MHz	GFSK	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

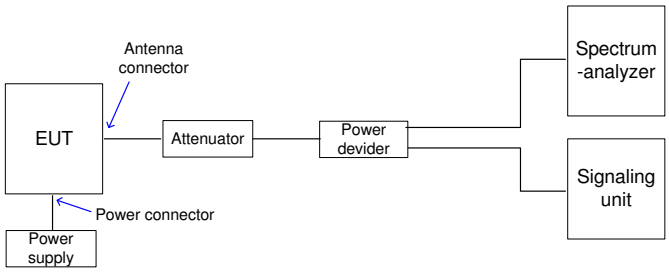
The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 25 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas 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, 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 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 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 2402 MHz	mid channel 2441 MHz	high channel 2480 MHz
Conducted power [dBm] Measured, GFSK modulation			
Radiated power [dBm] Measured, GFSK modulation			
Gain [dBi] Calculated			

5.5 Carrier frequency separation §15.247(a)(1)

Not performed

Modulation: GFSK

Plot 1 of 1:

Result: Channel separation is: ~ 1 MHz

Limits:

Under normal test conditions only	Minimum 25 kHz or 20 dB Bandwidth of the hopping system

5.6 Number of hopping channels §15.247(a)(1)

Not performed

Modulation: GFSK

Plot 1 of 2:

Plot 2 of 2:

Result: The number of hopping channels is: 79

Limits:

Under normal test conditions only	at least 15 non-overlapping channels

5.7 Time of occupancy (dwell time) §15.247(a)(1)(iii)

For Bluetooth devices:

The dwell time of 0.4 s within a 31.6 second period in data mode is independent from the packet type (packet length).
The calculation for a 31.6 second period is a follows:

Dwell time = time slot length * hop rate / number of hopping channels *31.6 s

Example for a DH1 packet (with a maximum length of one time slot)
Dwell time = 625 µs * 1600 1/s / 79 * 31.6 s = 0.4 s (in a 31.6 s period)

For multi-slot packet the hopping is reduced according to the length of the packet.
Example for a DH5 packet (with a maximum length of five time slots)
Dwell time = 5 * 625 µs * 1600 * 1/5 *1/s / 79 * 31.6 s = 0.4 s (in a 31.6 s period)

This is according the Bluetooth Core Specification V 1.1 & V 1.2 & V2.0 (+ critical errata) for all Bluetooth devices.
Therefore, all Bluetooth devices comply with the FCC dwell time requirement in the data mode.
This was checked during the Bluetooth Qualification tests.
The Dwell time in hybrid mode is approximately 2.6 ms (in a 12.8s period)

5.8 Power Spectral density (Hybrid system in Inquiry mode/Page scan) §15.247(e)

Not performed

Plot 1 of 1:

Not applicable

Result: Power density: - dBm/Hz = - dBm / 3 kHz
Correction factor from dBm/Hz to dBm / 3 kHz is +34,8 dB

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

5.9 Spectrum Bandwidth of a FHSS System / 20dB Bandwidth §15.247(a)(1)

Not performed

Result:

Modulation	**20 dB BANDWIDTH [kHz]**		
Frequency [MHz]	2402	2441	2480
GFSK			
Pi/4 DQPSK			
8DPSK			
Measurement uncertainty	±1kHz		

RBW / VBW as provided in the „Measurement Guidelines“ (DA 00-705, March 30, 2000)
RBW: 10 kHz / VBW 10 kHz

Limits:

Under normal test conditions only	GFSK < 1000 kHz Pi/4 DQPSK < 1500 8DPSK < 1500

5.10 Maximum output power (conducted) § 15.247 (b)(1)

Not performed

Results:

Modulation	**Max. peak output power [dBm]**		
Frequency [MHz]	2402	2441	2480
GFSK			
Pi/4 DQPSK			
8DPSK			
Measurement uncertainty	±2dB		

RBW / VBW: 3 MHz

Limits:

Under normal test conditions only, for frequency range 2400-2483.5 MHz	Max. 1.0 Watt

5.11 Max. peak output power (radiated) § 15.247 (b)(1)

Modulation: GFSK

Results:

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2402	2442	2480
T_{nom}	V_{nom}	6.51	8.36	**8.39**
Measurement uncertainty		±3dB		

RBW / VBW: 3 MHz
Measured at a distance of 3m

Modulation: Pi/4-DQPSK

Results:

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2402	2442	2480
T_{nom}	V_{nom}	6.20	**7.88**	7.70
Measurement uncertainty		±3dB		

RBW / VBW: 3 MHz
Measured at a distance of 3m

Modulation: 8DPSK

Results:

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2402	2442	2480
T_{nom}	V_{nom}	6.28	**8.71**	8.32
Measurement uncertainty		±3dB		

RBW / VBW: 3 MHz
Measured at a distance of 3m

Limits:

Under normal test conditions only, for frequency range 2400-2483.5 MHz	Max. 1.0 Watt

5.12 Band-edge compliance of conducted emissions §15.247 (d)

Not performed

Modulation: GFSK

Plot 1 of 4 (hopping off, lowest frequency):

Plot 2 of 4 (hopping on, lowest frequency):

Plot 3 of 4 (hopping off, highest frequency):

Plot 4 of 4 (hopping on, highest frequency):

Results:

SZENARIO	DELTA VALUE [DB]
hopping off, lowest frequency	> 20 dB
hopping on, lowest frequency	> 20 dB
hopping off, highest frequency	> 20 dB
hopping on, highest frequency	> 20 dB
Measurement uncertainty	±1,5dB

Modulation: Pi/4 DQPSK

Plot 1 of 4 (hopping off, lowest frequency):

Plot 2 of 4 (hopping on, lowest frequency):

Plot 3 of 4 (hopping off, highest frequency):

Plot 4 of 4 (hopping on, highest frequency):

Results:

SZENARIO	DELTA VALUE [DB]
hopping off, lowest frequency	> 20 dB
hopping on, lowest frequency	> 20 dB
hopping off, highest frequency	> 20 dB
hopping on, highest frequency	> 20 dB
Measurement uncertainty	±1,5dB

Modulation: 8 DPSK

Plot 1 of 4 (hopping off, lowest frequency):

Plot 2 of 4 (hopping on, lowest frequency):

Plot 3 of 4 (hopping off, highest frequency):

Plot 4 of 4 (hopping on, highest frequency):

Results:

SZENARIO	DELTA VALUE [DB]
hopping off, lowest frequency	> 20 dB
hopping on, lowest frequency	> 20 dB
hopping off, highest frequency	> 20 dB
hopping on, highest frequency	> 20 dB
Measurement uncertainty	±1,5dB

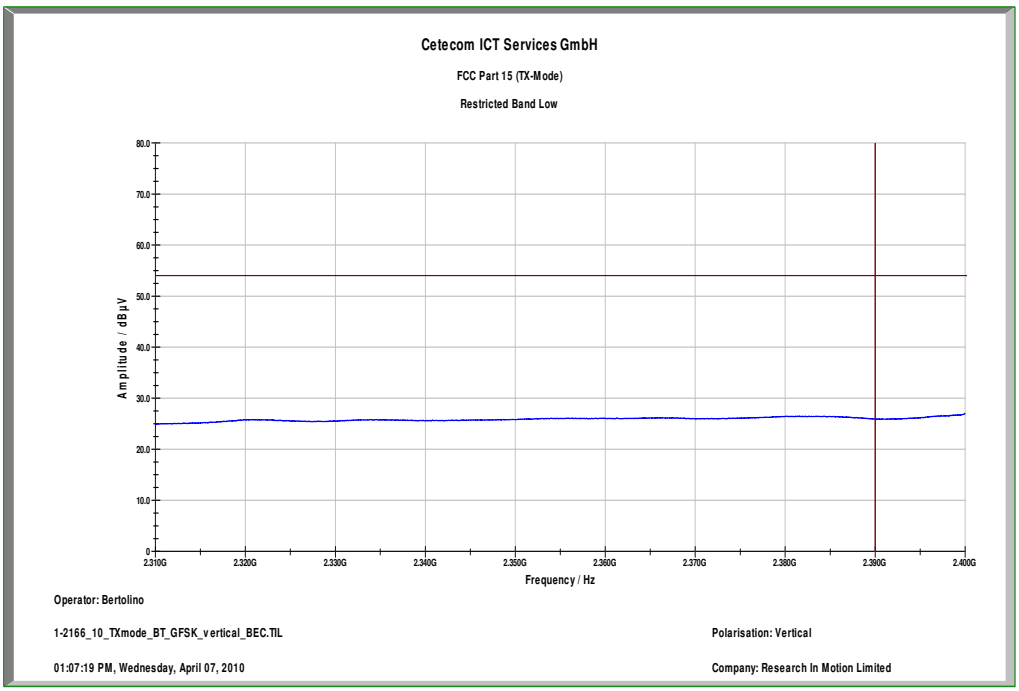
Limits:

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)).

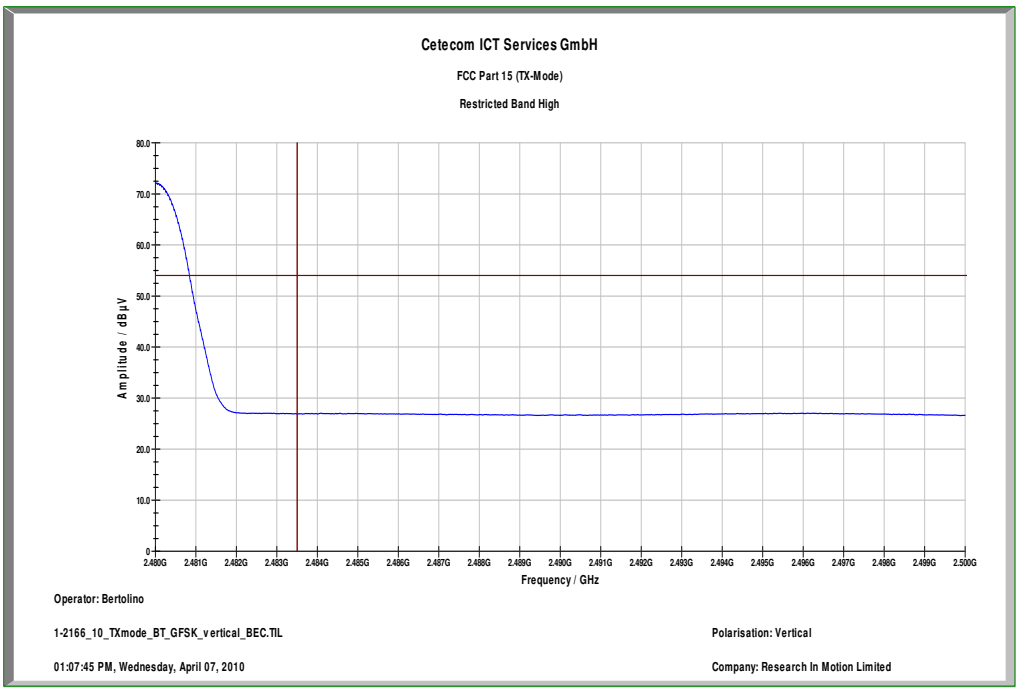
5.13 Band-edge compliance of radiated emissions §15.205

Modulation: *GFSK*

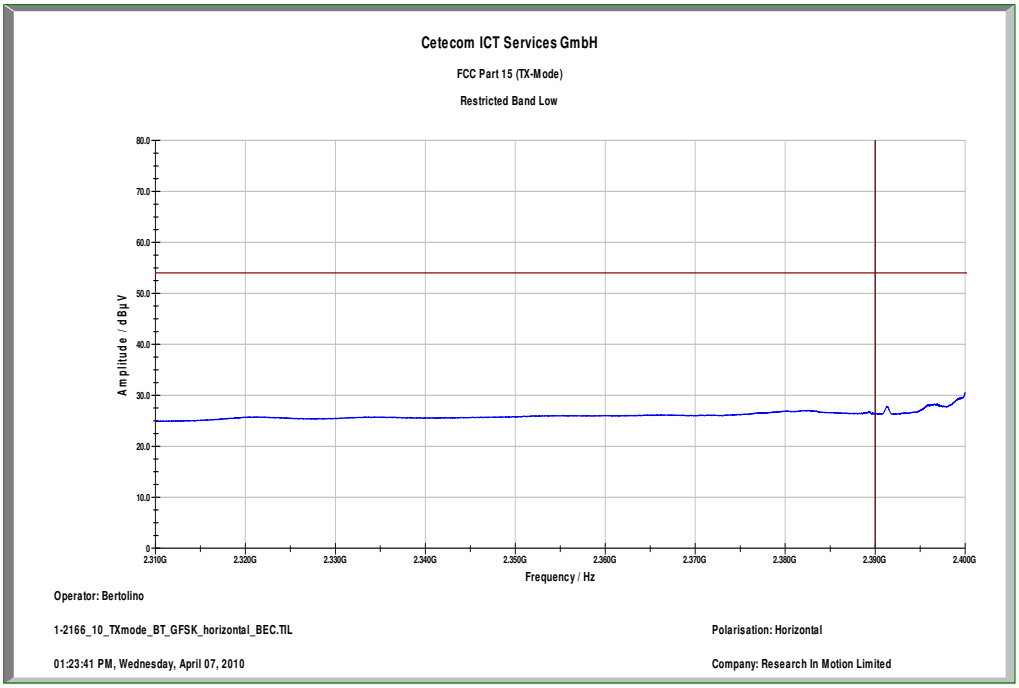
Plot 1: low band edge, vertical polarization



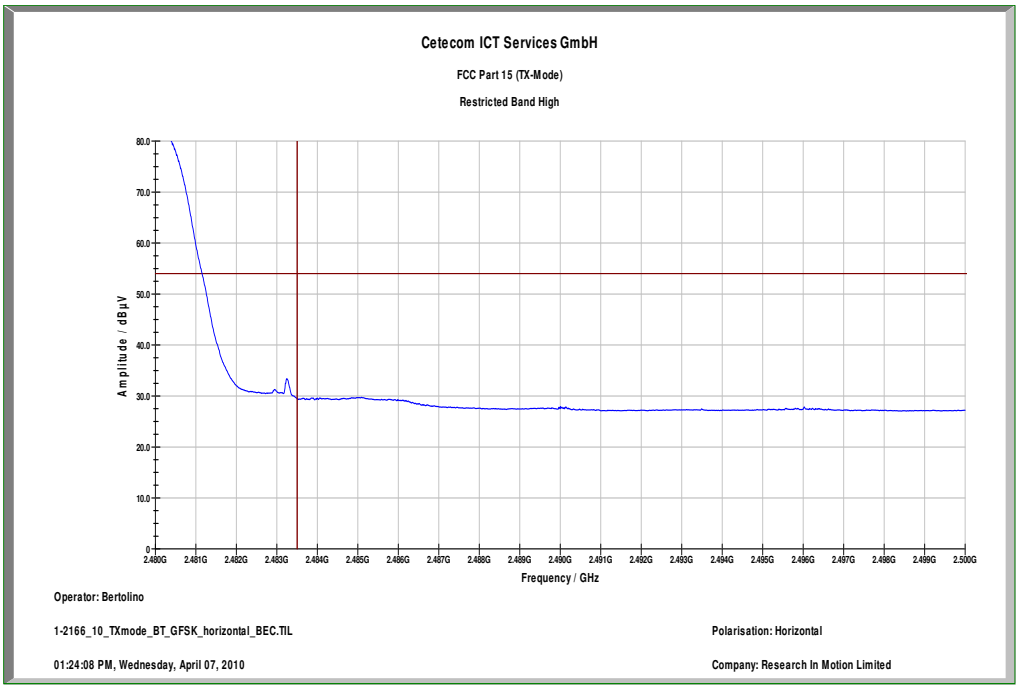
Plot 2: high band edge, vertical polarization



Plot 3: low band edge, horizontal polarization

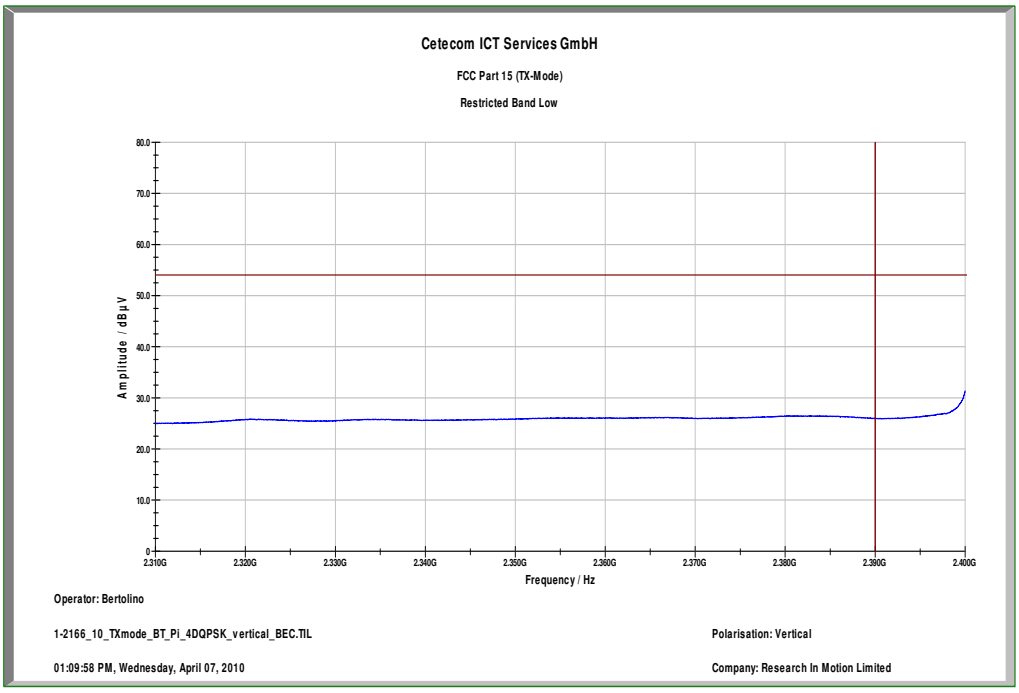


Plot 4: high band edge, horizontal polarization

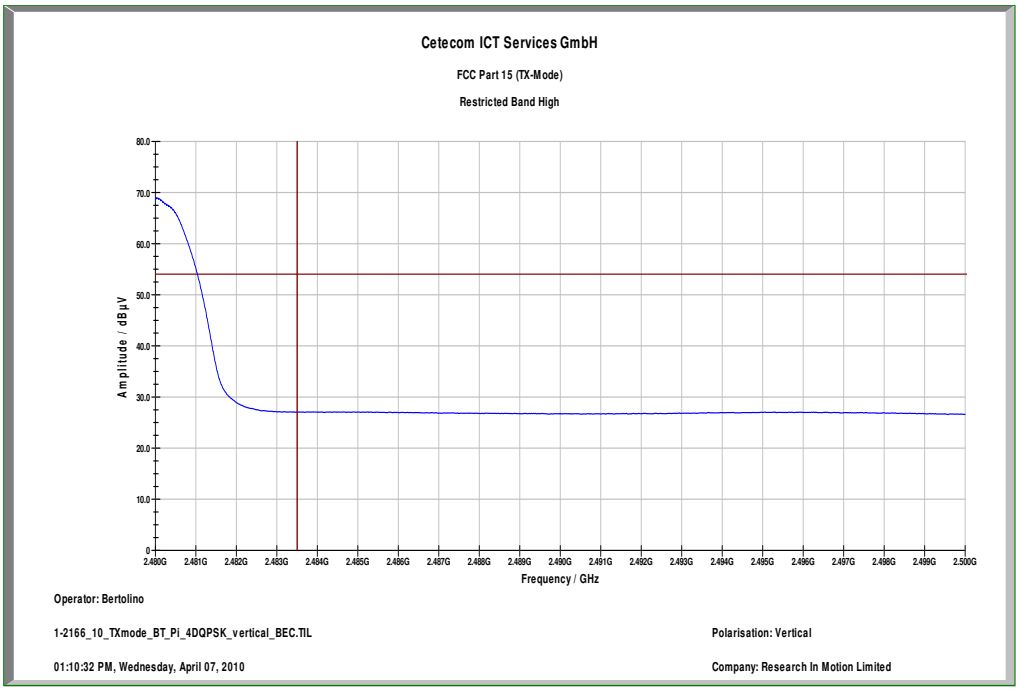


Modulation: *Pi/4-DQPSK*

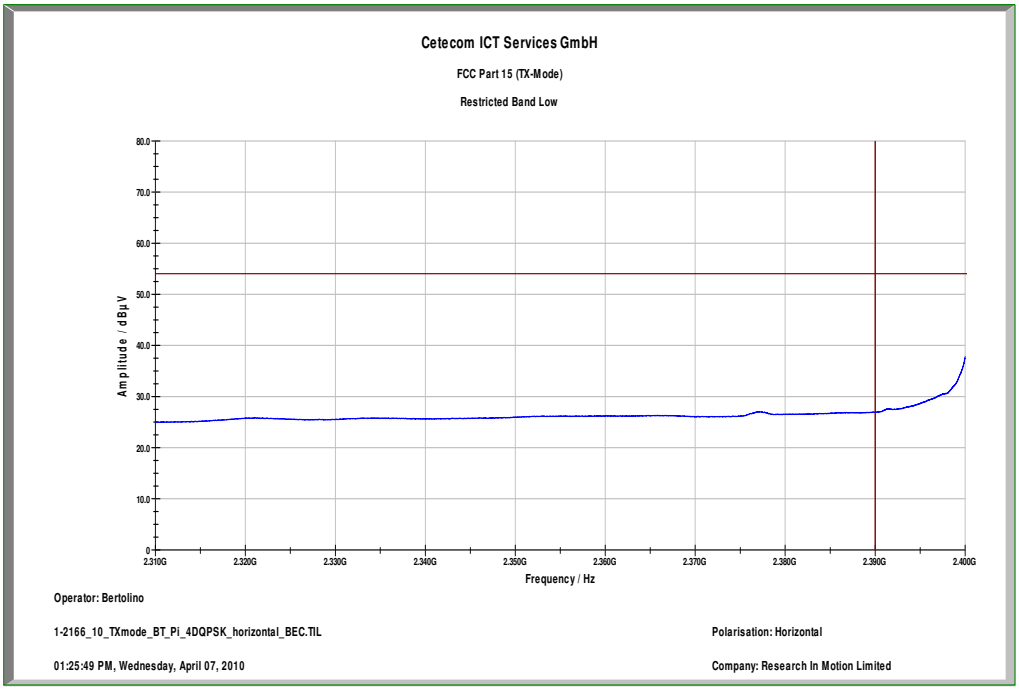
Plot 1: low band edge, vertical polarization



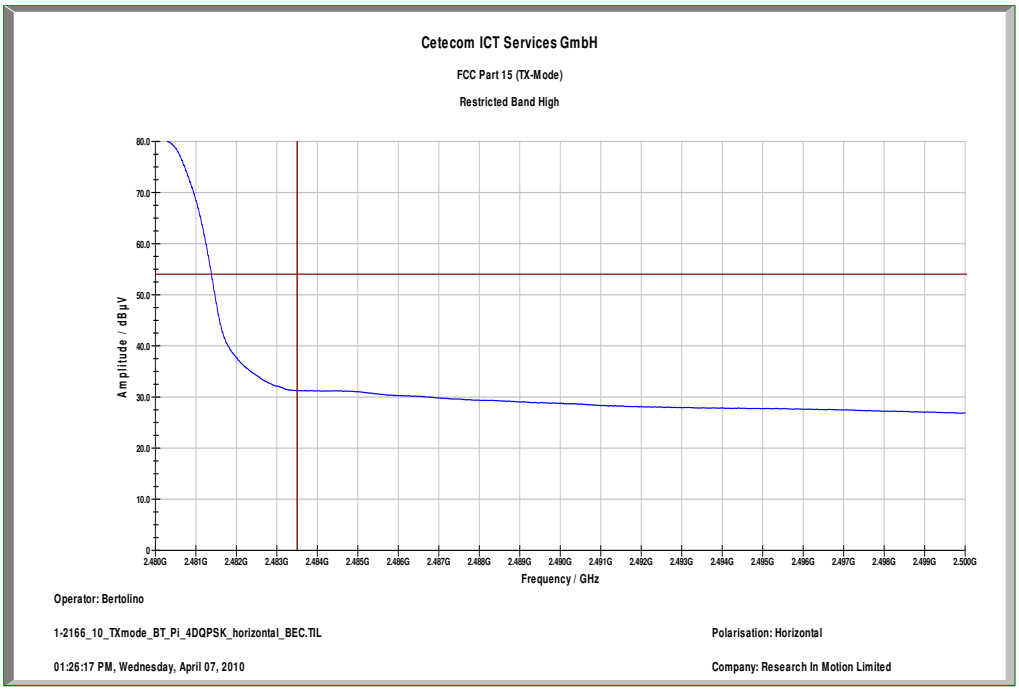
Plot 2: high band edge, vertical polarization



Plot 3: low band edge, horizontal polarization

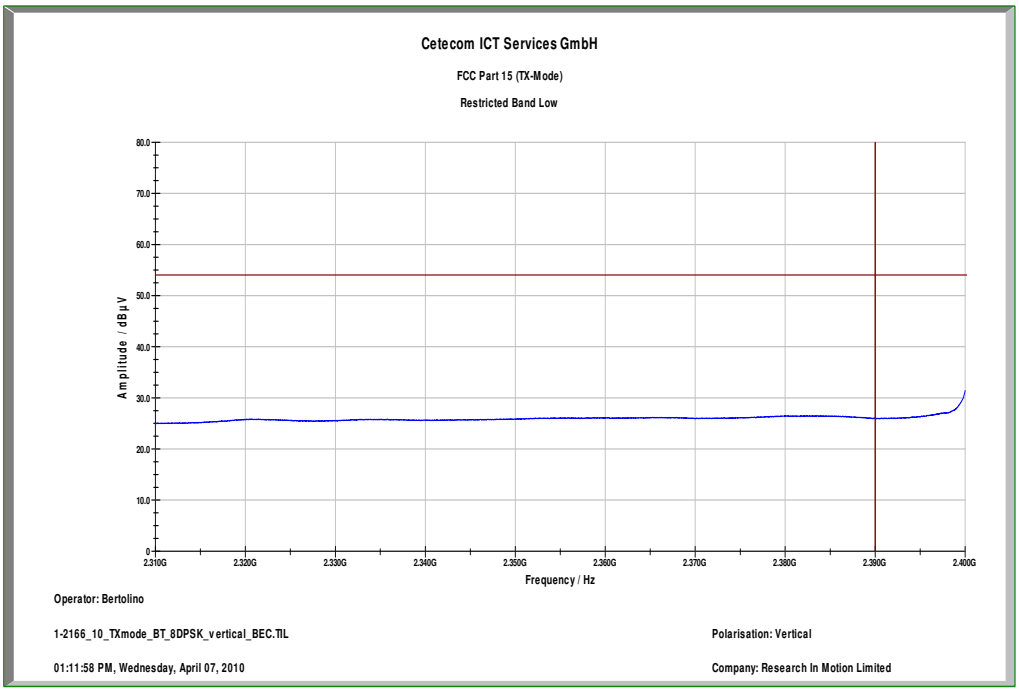


Plot 4: high band edge, horizontal polarization

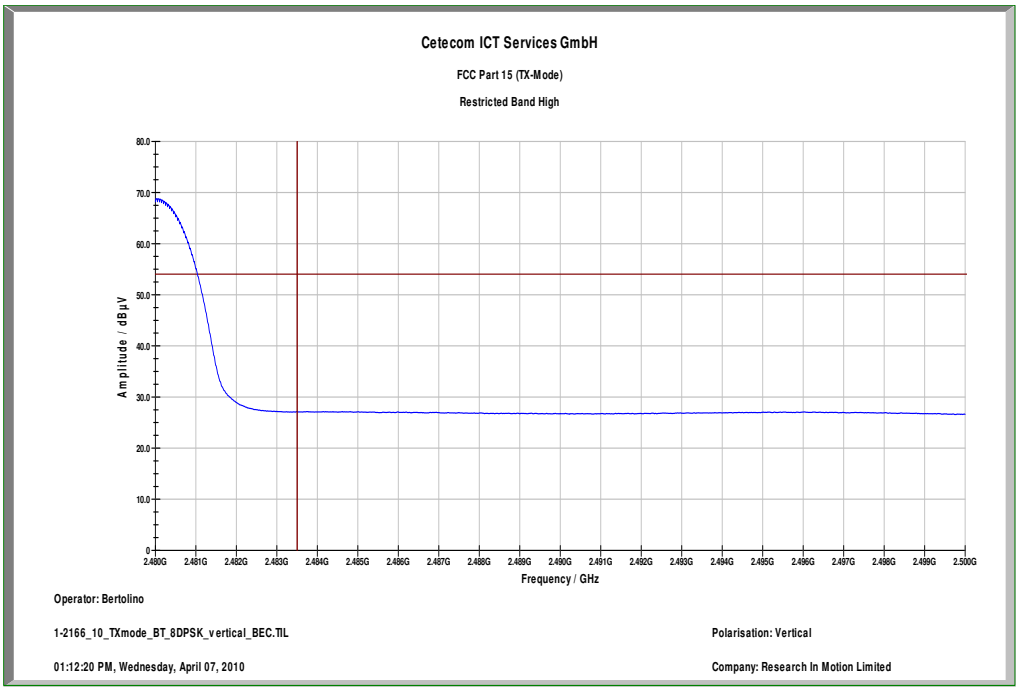


Modulation: *8-DPSK*

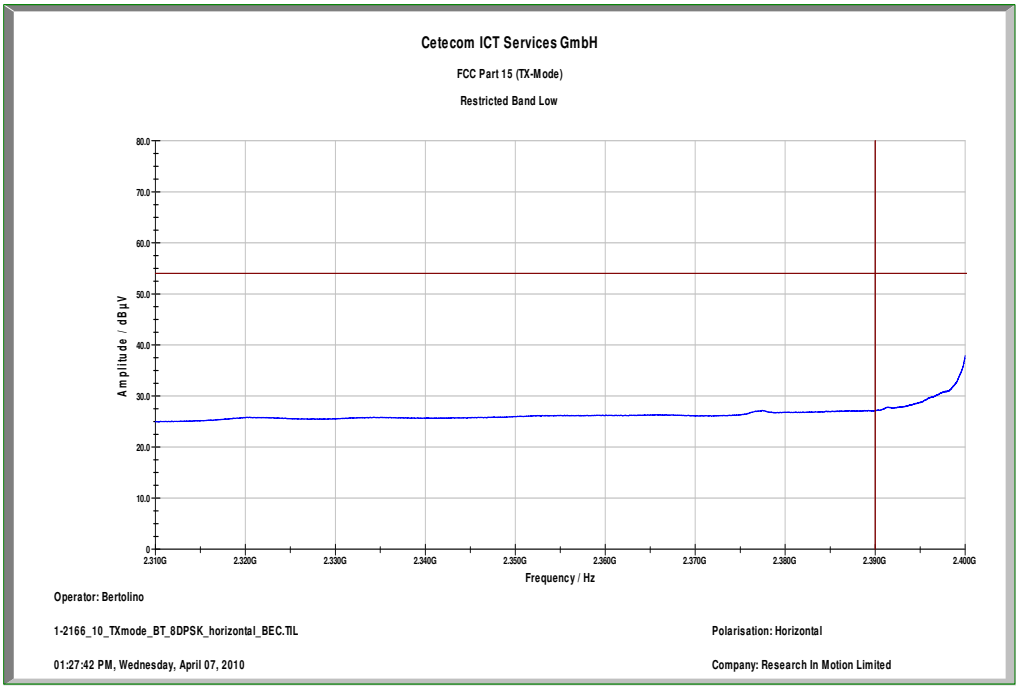
Plot 1: low band edge, vertical polarization



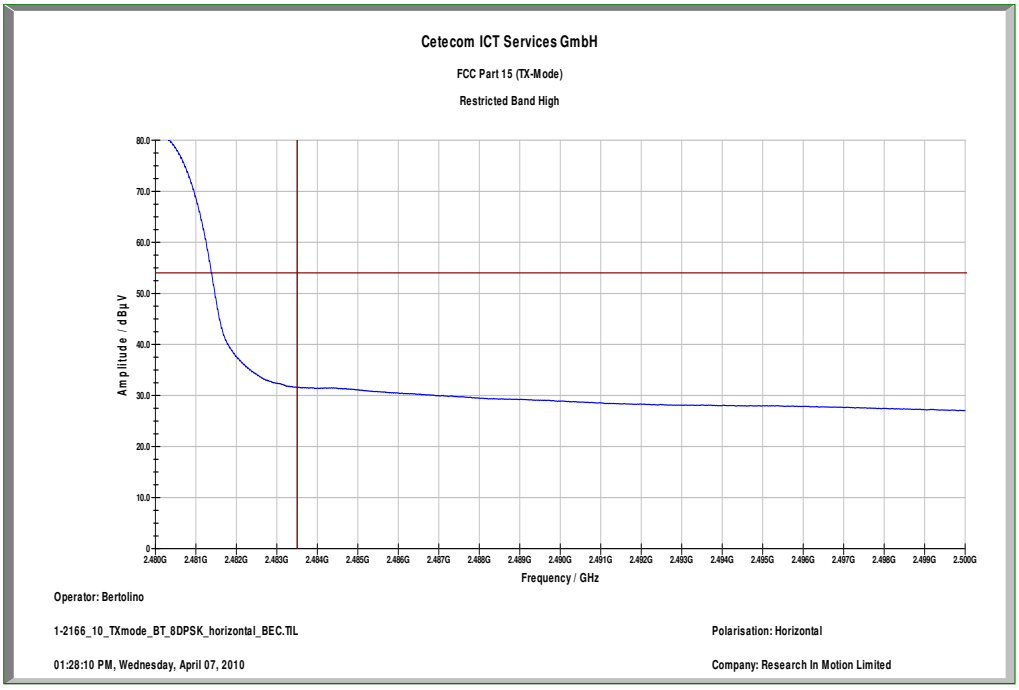
Plot 2: high band edge, vertical polarization



Plot 3: low band edge, horizontal polarization



Plot 4: high band edge, horizontal polarization



5.14 Spurious Emissions - conducted (Transmitter) § 15.247 (c)(1)

Not performed

Modulation: GFSK

Plot 1 of 3: lowest channel

Plot 2 of 3: middle channel

Plot 3 of 3: highest channel

Result & Limits:

Emission Limitation					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
2402			30 dBm		Operating frequency
			-20 dBc		complies
					complies
2441			30 dBm		Operating frequency
			-20 dBc		complies
					complies
2480			30 dBm		Operating frequency
			-20 dBc		complies
					complies
Measurement uncertainty		± 3dB			

F < 1 GHz: RBW: 100 kHz VBW: 100 kHz
F > 1 GHz: RBW: 1 MHz VBW: 1 MHz

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)).

Note: For emissions that fall into restricted bands you find the radiated emissions later in the report.

Modulation: Pi/4 DQPSK

Plot 1 of 3: lowest channel

Plot 2 of 3: middle channel

Plot 3 of 3: highest channel

Result & Limits:

Emission Limitation					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
2402			30 dBm		Operating frequency
			-20 dBc		complies
					complies
2441			30 dBm		Operating frequency
			-20 dBc		complies
					complies
2480			30 dBm		Operating frequency
			-20 dBc		complies
					complies
Measurement uncertainty			± 3dB		

F < 1 GHz: RBW: 100 kHz VBW: 100 kHz
F > 1 GHz: RBW: 1 MHz VBW: 1 MHz

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)).

Note: For emissions that fall into restricted bands you find the radiated emissions later in the report.

Modulation: 8 DPSK

Plot 1 of 3: lowest channel

Plot 2 of 3: middle channel

Plot 3 of 3: highest channel

Result & Limits:

Emission Limitation					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
2402			30 dBm		Operating frequency
			-20 dBc		complies
					complies
2441			30 dBm		Operating frequency
			-20 dBc		complies
					complies
2480			30 dBm		Operating frequency
			-20 dBc		complies
					complies
Measurement uncertainty		± 3dB			

F < 1 GHz: RBW: 100 kHz VBW: 100 kHz
F > 1 GHz: RBW: 1 MHz VBW: 1 MHz

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)).

Note: For emissions that fall into restricted bands you find the radiated emissions later in the report.

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

Modulation: GFSK

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

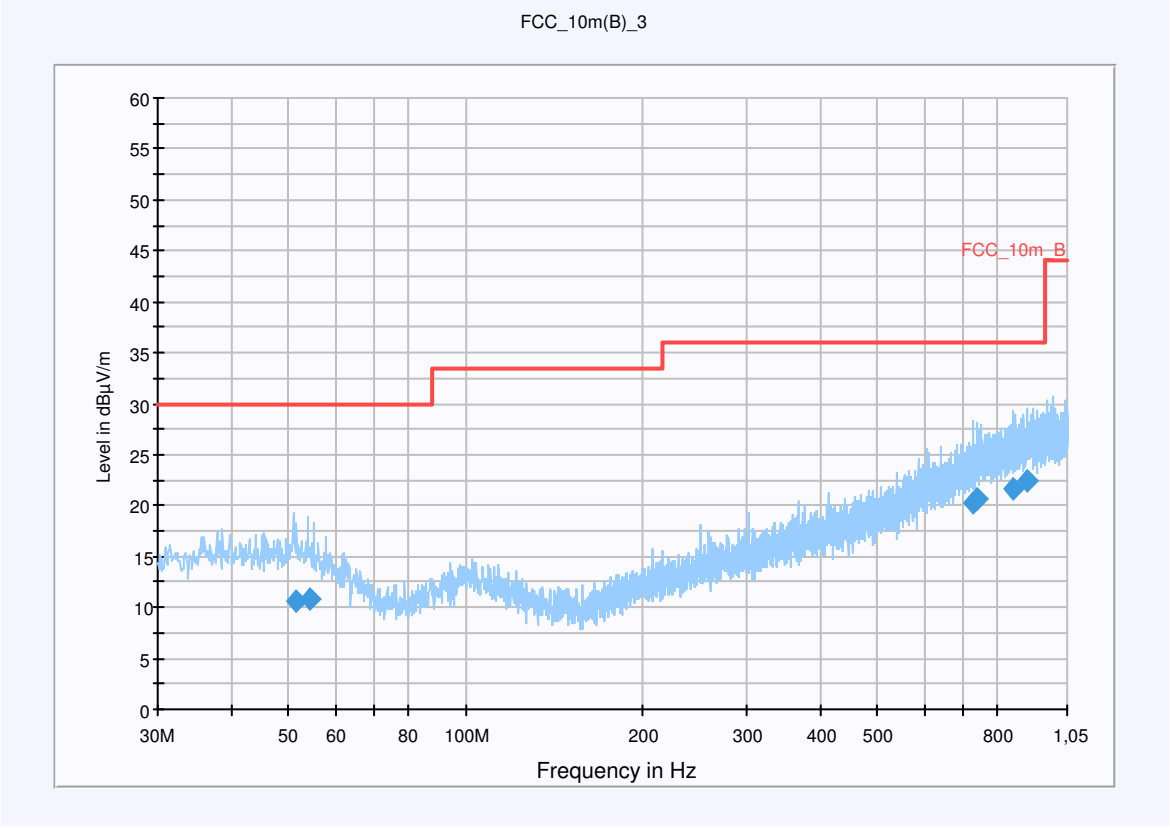
Common Information

EUT:	RCW41GW
Serial Number:	IMEI: 004401.13.588929.9
Test Description:	FCC Part 15C
Operating Conditions:	BT CH:0
Operator Name:	LANGER
Comment:	batterie 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



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
51.451800	10.6	15000.000	120.000	220.0	V	48.0	13.2	19.4	30.0	
54.463800	10.9	15000.000	120.000	154.0	V	223.0	12.9	19.1	30.0	
728.777700	20.3	15000.000	120.000	220.0	V	222.0	23.1	15.7	36.0	
740.701350	20.6	15000.000	120.000	172.0	H	47.0	23.4	15.4	36.0	
850.900500	21.7	15000.000	120.000	177.0	V	0.0	24.6	14.3	36.0	
897.622800	22.4	15000.000	120.000	220.0	V	235.0	25.2	13.6	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

	Subrange 1
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

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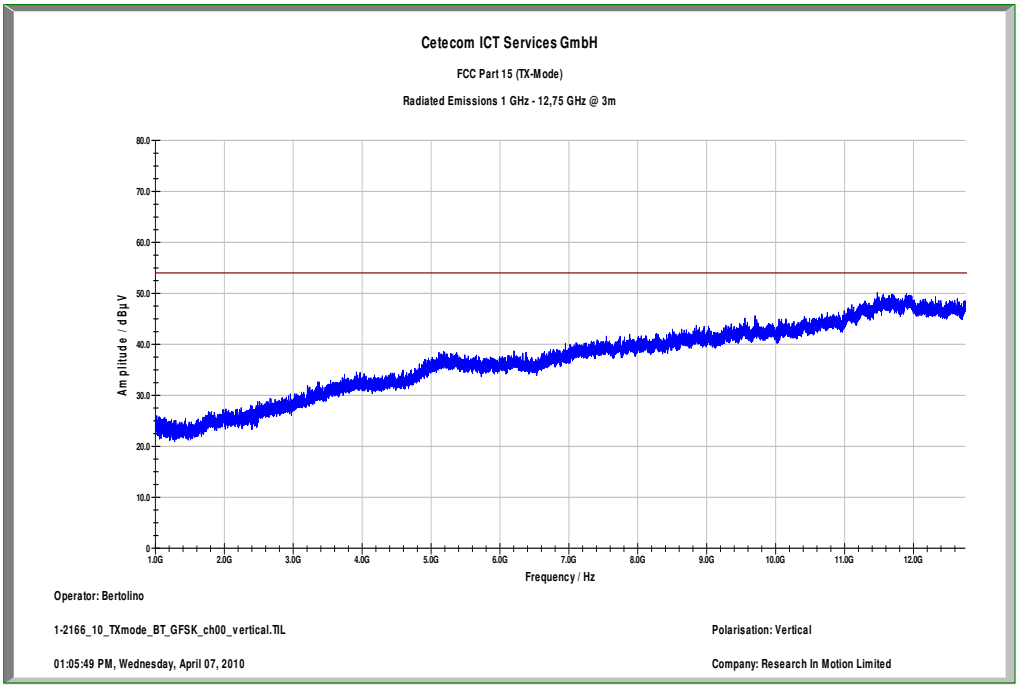
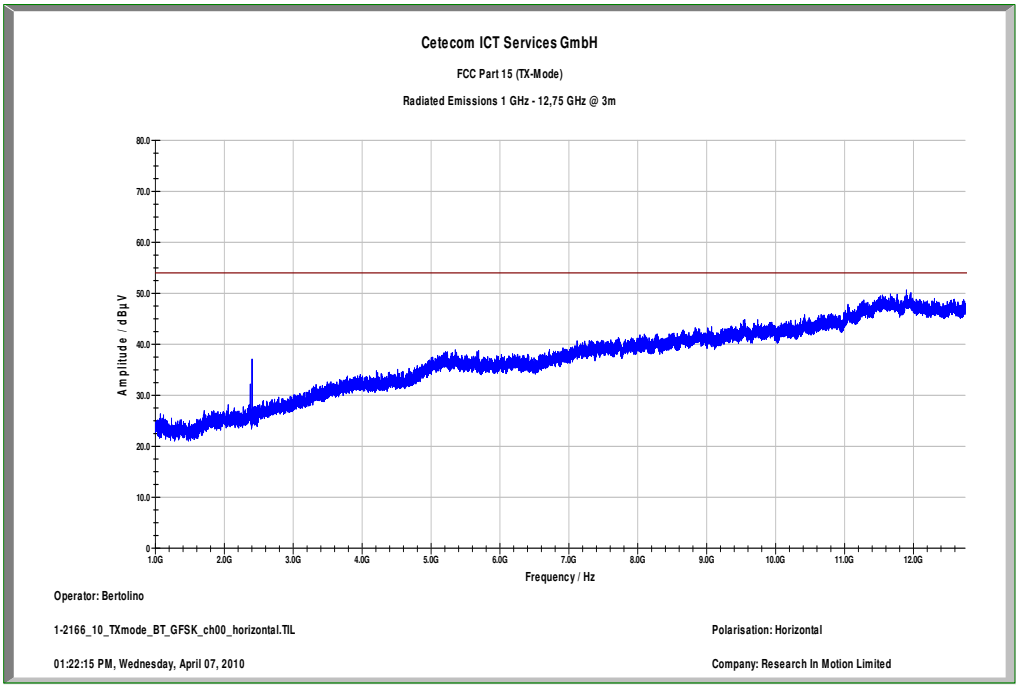
Plot 2: 1 – 12.75 GHz vertical polarization (lowest channel)



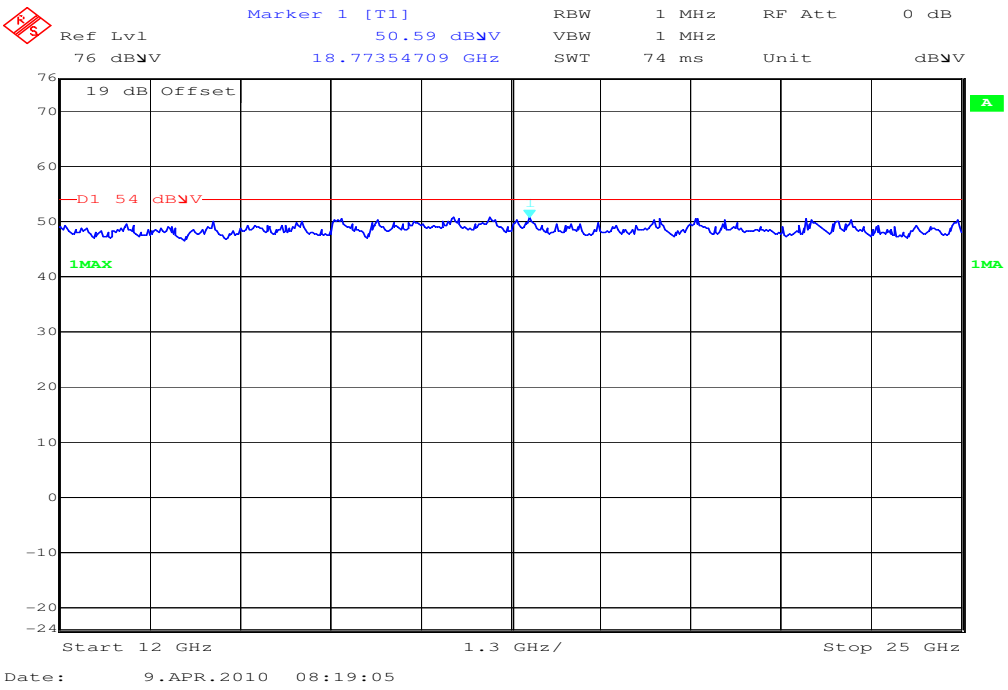
Carrier suppressed with a rejection filter.

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



Carrier suppressed with a rejection filter.

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



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

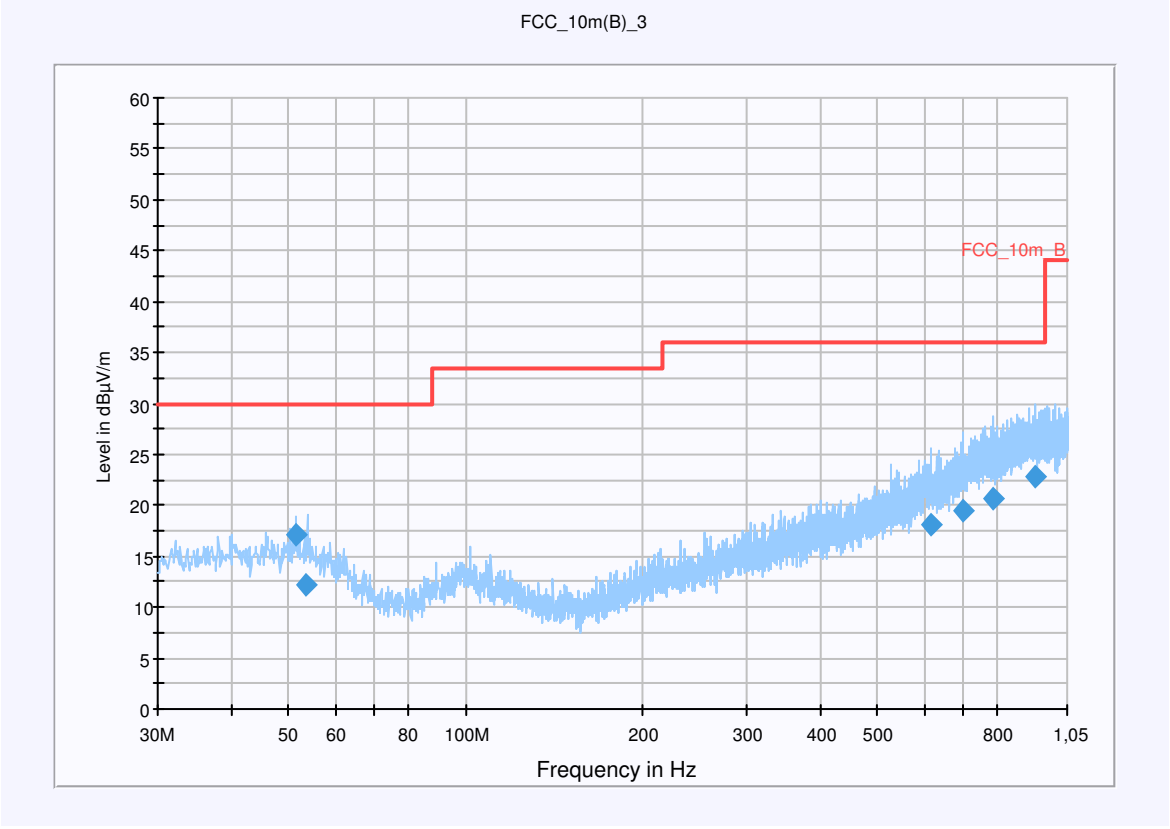
Common Information

EUT:	RCW41GW
Serial Number:	IMEI: 004401.13.588929.9
Test Description:	FCC Part 15C
Operating Conditions:	BT Tx CH:39
Operator Name:	LANGER
Comment:	batterie 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



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
51.611550	17.1	15000.000	120.000	98.0	V	74.0	13.2	12.9	30.0	
53.404950	12.2	15000.000	120.000	98.0	V	251.0	13.0	17.8	30.0	
615.577800	18.1	15000.000	120.000	220.0	H	180.0	20.9	17.9	36.0	
699.083100	19.6	15000.000	120.000	153.0	H	13.0	22.4	16.4	36.0	
788.061300	20.7	15000.000	120.000	220.0	H	212.0	23.8	15.3	36.0	
927.463350	22.9	15000.000	120.000	165.0	V	324.0	25.3	13.1	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

	Subrange 1
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

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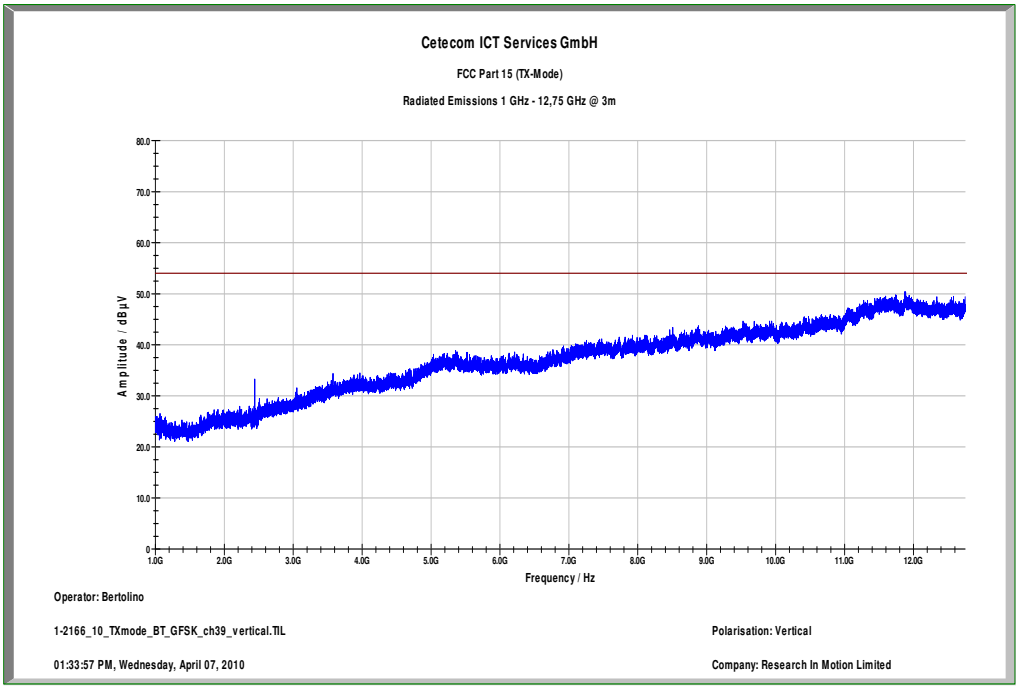
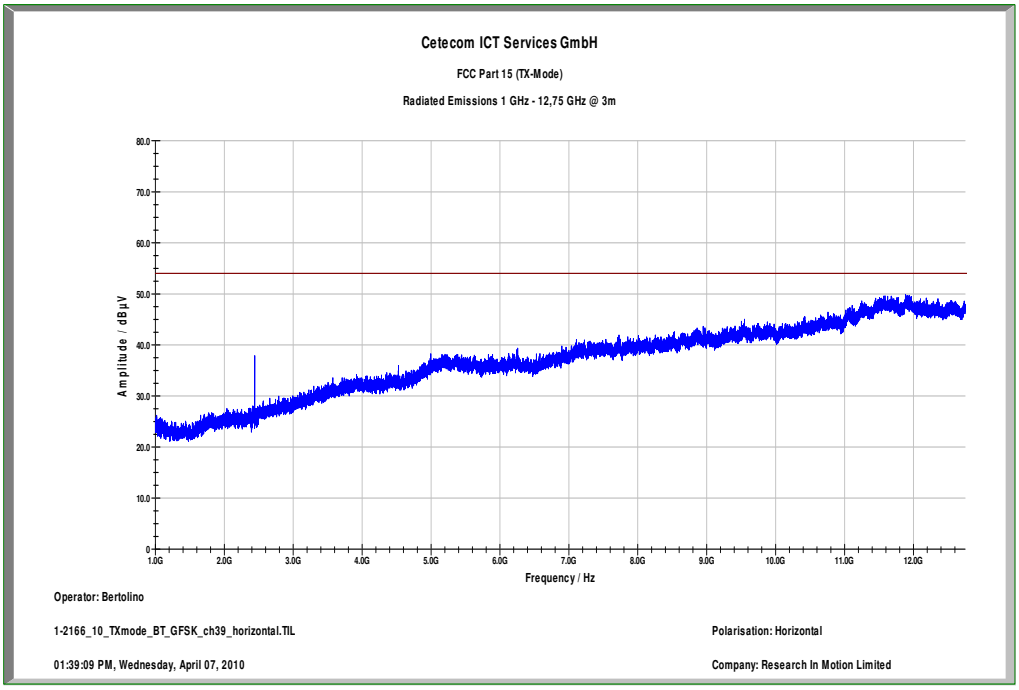
Plot 6: 1 – 12.75 GHz vertical polarization (middle channel)



Carrier suppressed with a rejection filter.

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



Carrier suppressed with a rejection filter.

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

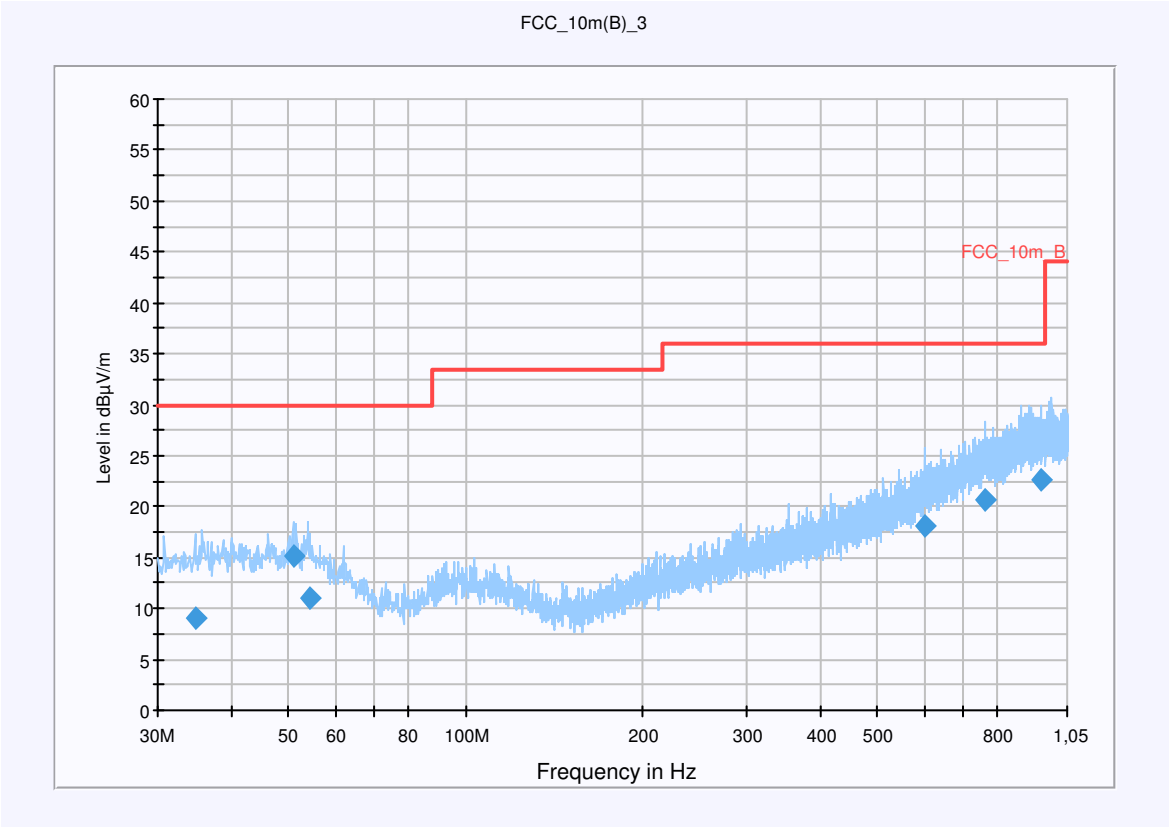
Common Information

EUT:	RCW41GW
Serial Number:	IMEI: 004401.13.588929.9
Test Description:	FCC Part 15C
Operating Conditions:	BT Tx CH:78
Operator Name:	LANGER
Comment:	batterie 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



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
34.885500	9.1	15000.000	120.000	187.0	H	211.0	13.0	20.9	30.0	
51.026100	15.2	15000.000	120.000	137.0	V	299.0	13.3	14.8	30.0	
54.537750	10.9	15000.000	120.000	105.0	V	26.0	12.9	19.1	30.0	
602.980350	18.1	15000.000	120.000	220.0	H	52.0	20.8	17.9	36.0	
759.223200	20.6	15000.000	120.000	98.0	V	184.0	23.6	15.4	36.0	
946.171500	22.5	15000.000	120.000	98.0	V	42.0	25.3	13.5	36.0	

Hardware Setup: **EMI radiated\Electric Field (NOS) - [EMI radiated]**

	Subrange 1
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

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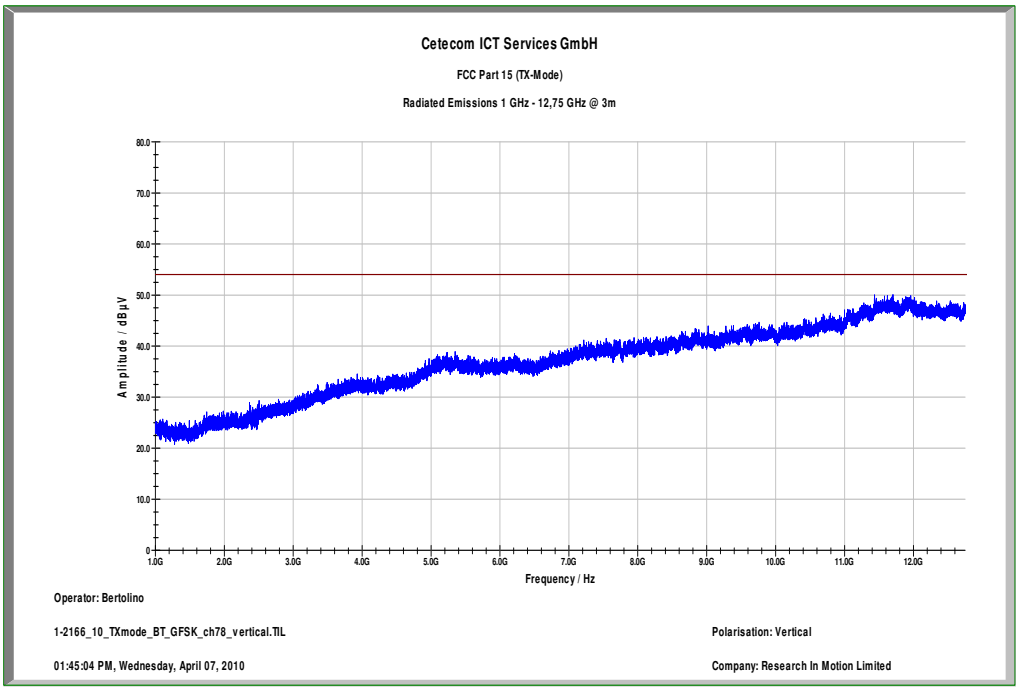
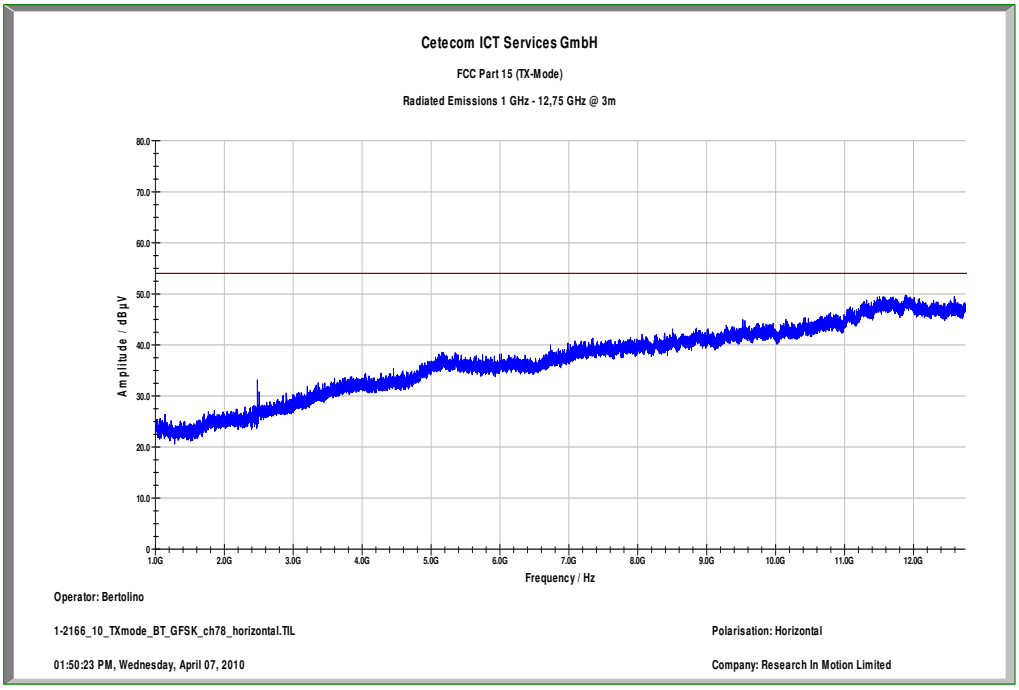
Plot 9: 1 – 12.75 GHz vertical polarization (highest channel)



Carrier suppressed with a rejection filter.

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



Carrier suppressed with a rejection filter.

Modulation: 8-DPSK

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

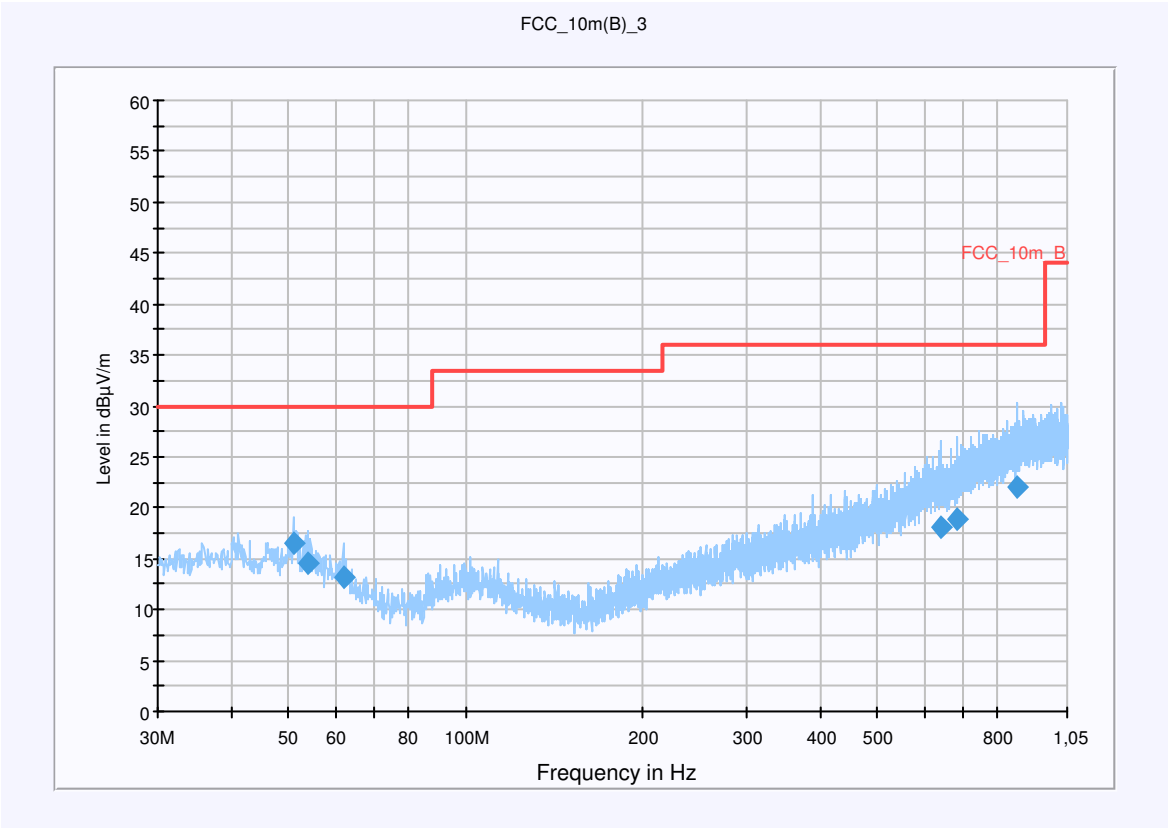
Common Information

EUT:	RCW41GW
Serial Number:	IMEI: 004401.13.588929.9
Test Description:	FCC Part 15C
Operating Conditions:	BT 3DH5 TX Ch.0
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



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
50.995650	16.5	15000.000	120.000	120.0	V	324.0	13.3	13.5	30.0	
54.016650	14.6	15000.000	120.000	129.0	V	141.0	13.0	15.4	30.0	
62.000400	13.1	15000.000	120.000	141.0	V	230.0	11.1	16.9	30.0	
642.975150	18.1	15000.000	120.000	220.0	V	225.0	21.0	17.9	36.0	
683.128950	19.0	15000.000	120.000	220.0	V	204.0	22.0	17.0	36.0	
864.872250	22.0	15000.000	120.000	220.0	V	48.0	24.7	14.0	36.0	

Hardware Setup: **EMI radiated\Electric Field (NOS) - [EMI radiated]**

	Subrange 1
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

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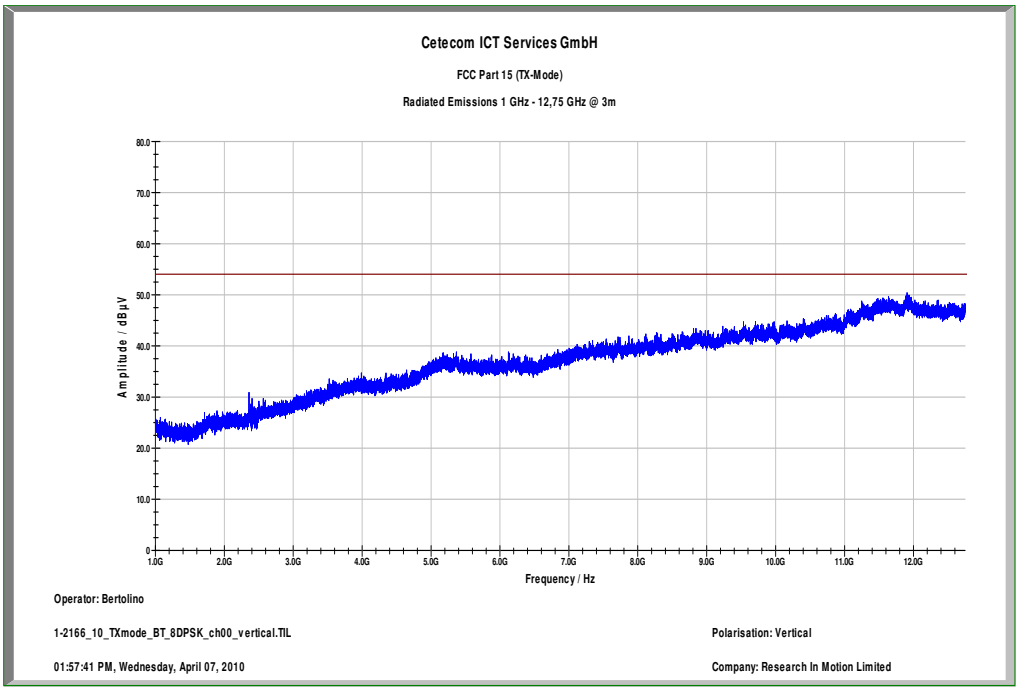
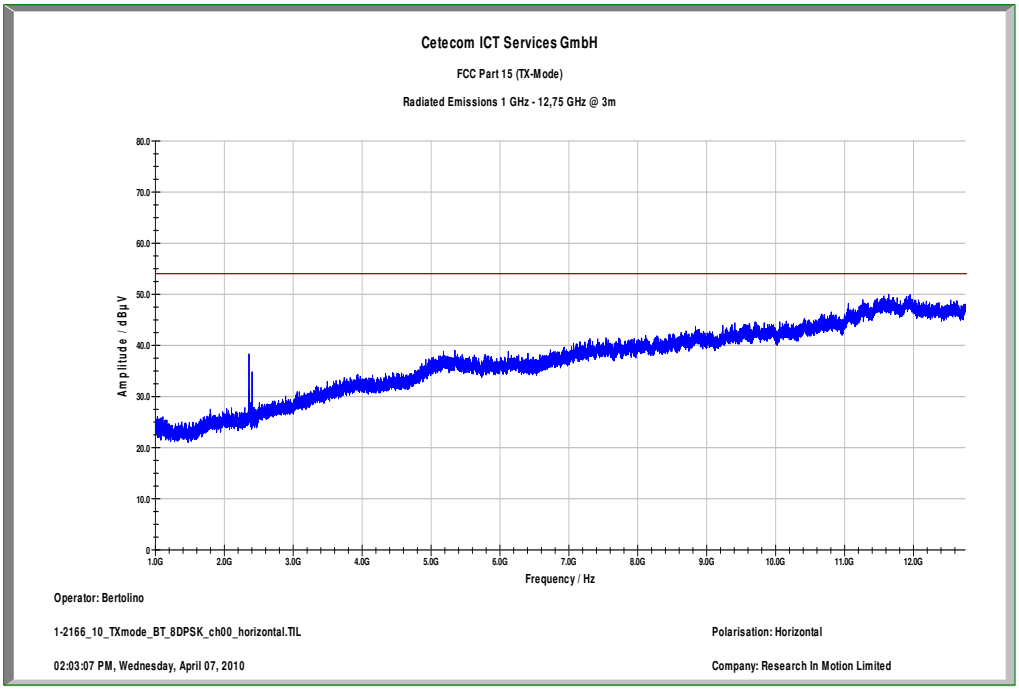
Plot 2: 1 – 12.75 GHz vertical polarization (lowest channel)



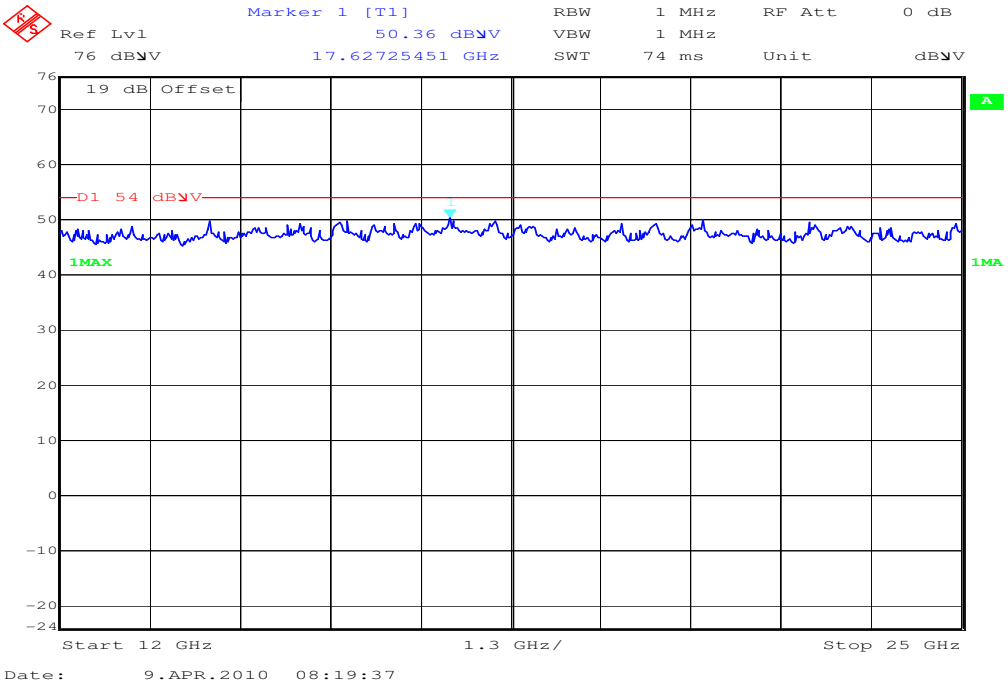
Carrier suppressed with a rejection filter.

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



Carrier suppressed with a rejection filter.

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



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

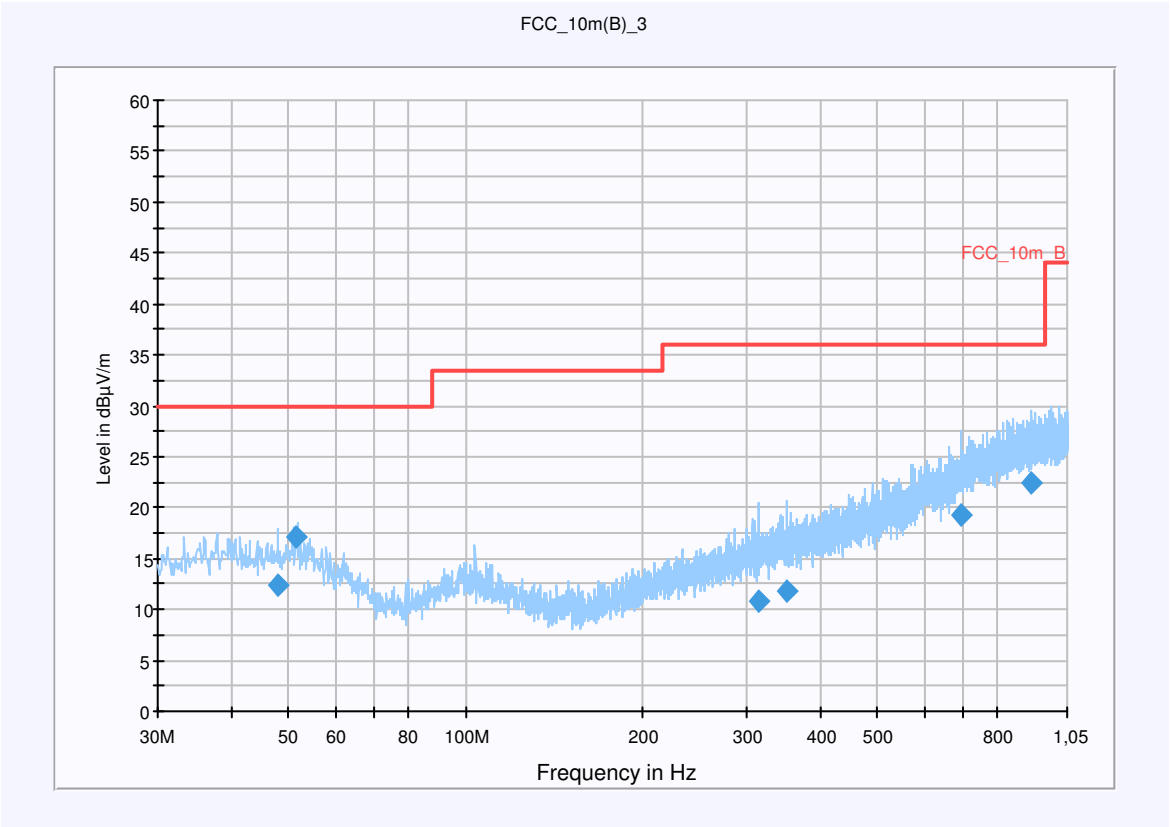
Common Information

EUT:	RCW41GW
Serial Number:	IMEI: 004401.13.588929.9
Test Description:	FCC Part 15C
Operating Conditions:	BT 3DH5 TX Ch.39
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



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
47.914650	12.4	15000.000	120.000	112.0	V	149.0	13.3	17.6	30.0	
51.604200	17.1	15000.000	120.000	98.0	V	10.0	13.2	12.9	30.0	
313.649400	10.8	15000.000	120.000	152.0	V	235.0	14.9	25.2	36.0	
350.690100	11.9	15000.000	120.000	203.0	H	299.0	16.0	24.1	36.0	
691.010550	19.3	15000.000	120.000	98.0	H	0.0	22.2	16.7	36.0	
914.594250	22.3	15000.000	120.000	220.0	V	39.0	25.2	13.7	36.0	

Hardware Setup: **EMI radiated\Electric Field (NOS) - [EMI radiated]**

	Subrange 1
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

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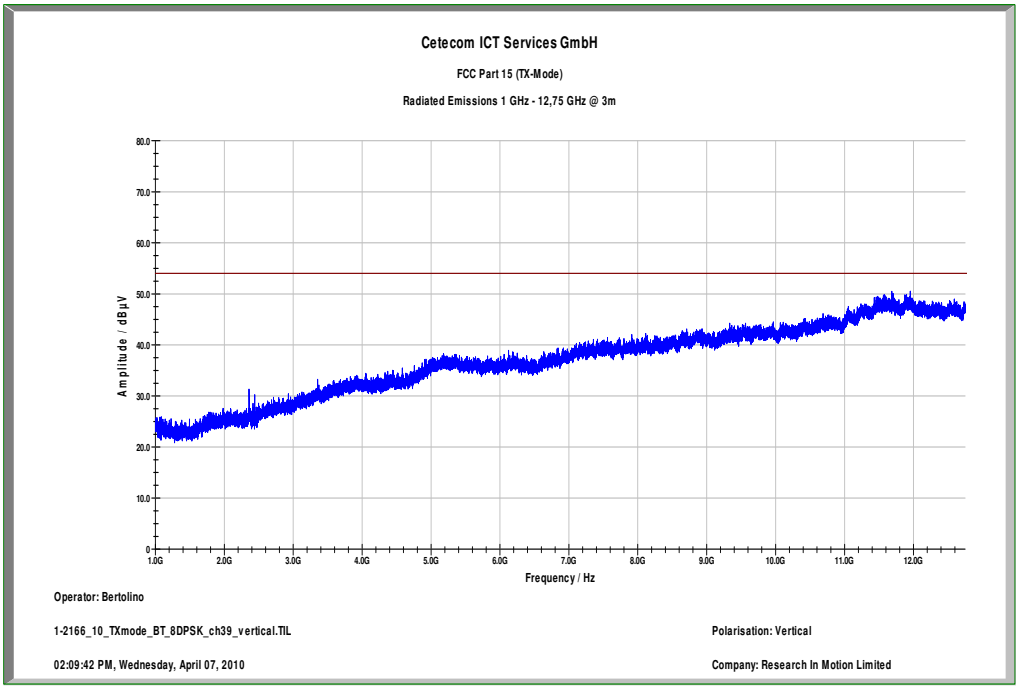
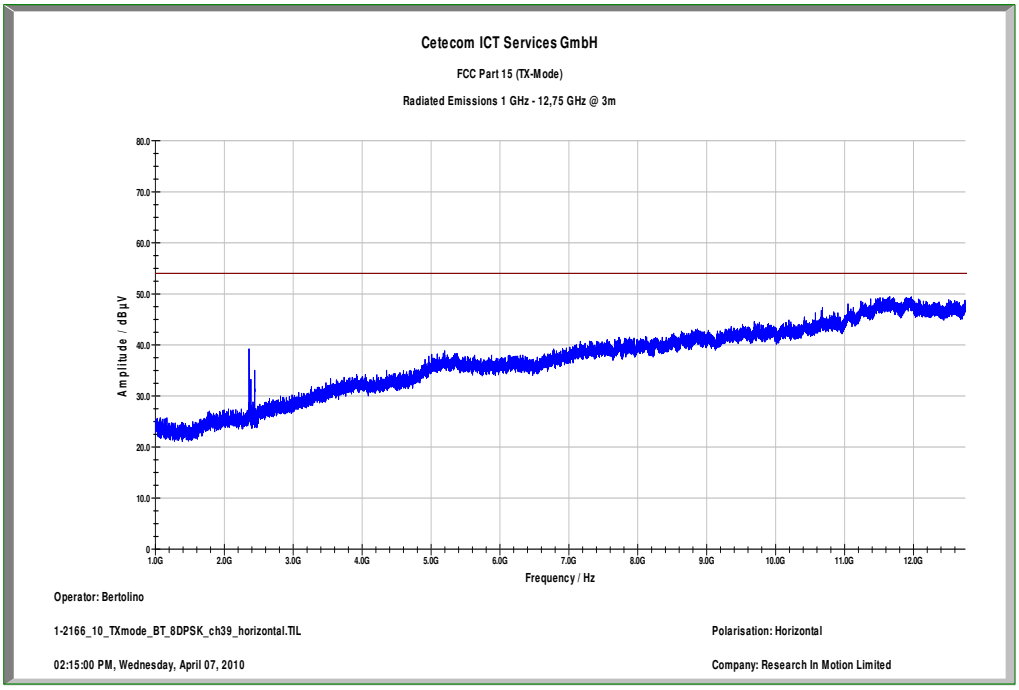
Plot 6: 1 – 12.75 GHz vertical polarization (middle channel)



Carrier suppressed with a rejection filter.

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



Carrier suppressed with a rejection filter.

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

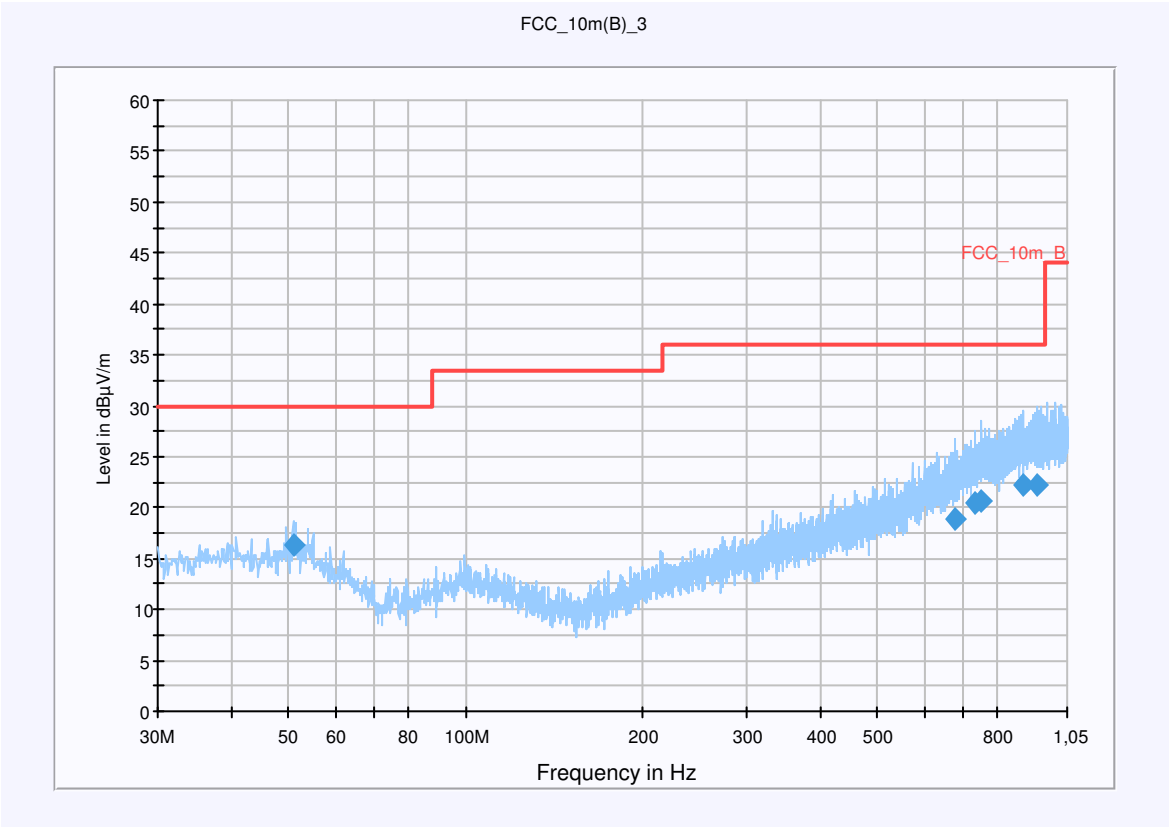
Common Information

EUT:	RCW41GW
Serial Number:	IMEI: 004401.13.588929.9
Test Description:	FCC Part 15C
Operating Conditions:	BT 3DH5 TX Ch.78
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



Final Result 1

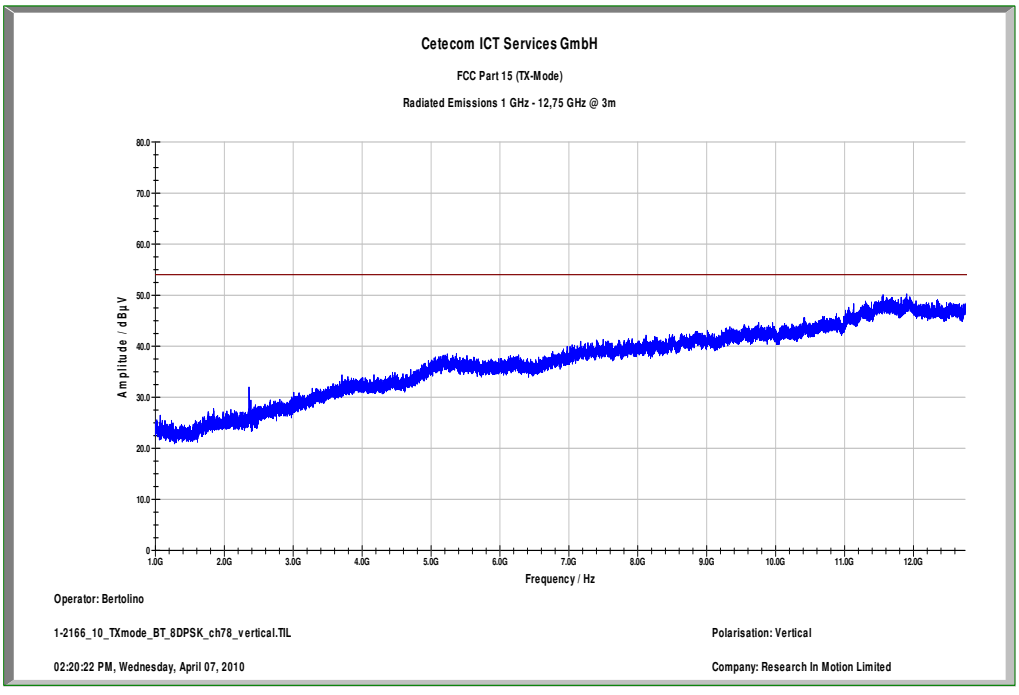
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
50.997750	16.3	15000.000	120.000	112.0	V	224.0	13.3	13.7	30.0	
675.900450	18.8	15000.000	120.000	220.0	V	61.0	21.8	17.2	36.0	
733.576050	20.4	15000.000	120.000	220.0	V	169.0	23.2	15.6	36.0	
749.457000	20.7	15000.000	120.000	220.0	H	48.0	23.6	15.3	36.0	
881.692800	22.3	15000.000	120.000	105.0	V	71.0	25.0	13.7	36.0	
936.870450	22.3	15000.000	120.000	220.0	V	311.0	25.3	13.7	36.0	

Hardware Setup: **EMI radiated\Electric Field (NOS) - [EMI radiated]**

	Subrange 1
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

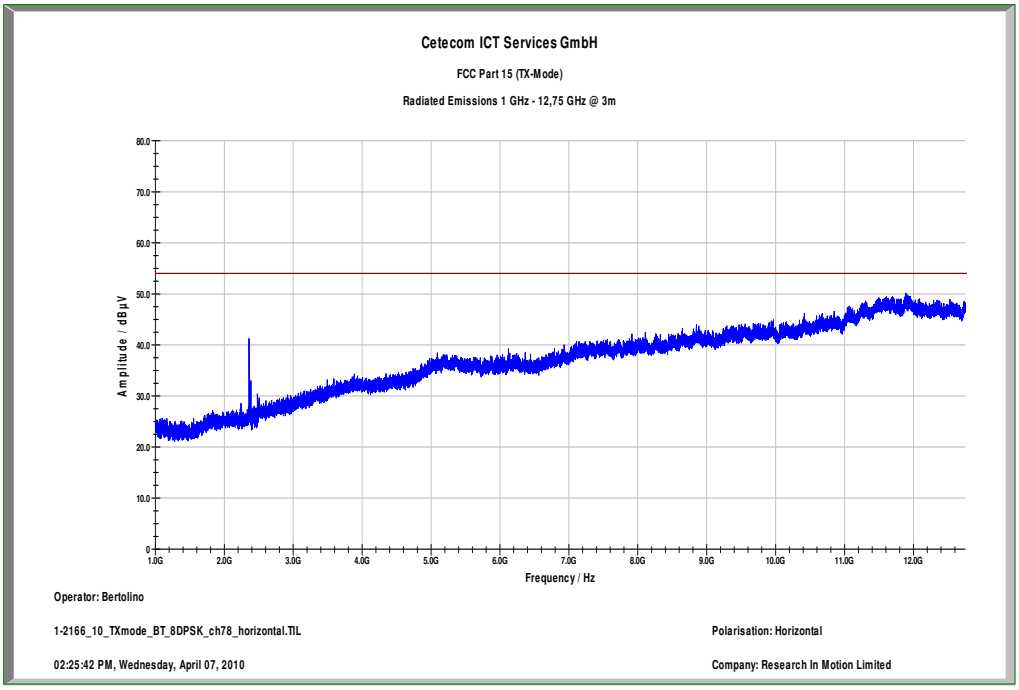
EMC 32 Version 8.10.00

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



Carrier suppressed with a rejection filter.

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



Carrier suppressed with a rejection filter.

Results: GFSK-Modulation

SPURIOUS EMISSIONS LEVEL (dBµV/m)								
2402 MHz			2441 MHz			2480 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No harmonics or spurious emissions detected.			No harmonics or spurious emissions detected.			No harmonics or spurious emissions detected.		
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW = 1 MHz / VBW = 10 Hz

Results: 8-DPSK-Modulation

SPURIOUS EMISSIONS LEVEL (dBµV/m)								
2402 MHz			2441 MHz			2480 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No harmonics or spurious emissions detected.			No harmonics or spurious emissions detected.			No harmonics or spurious emissions detected.		
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW = 1 MHz / VBW = 10 Hz

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 [µV/m]	Measurement distance (m)
30 - 88	100 (40 dBµV/m)	3
88 - 216	150 (43.5 dBµV/m)	3
216 - 960	200 (46 dBµV/m)	3
above 960	500 (54 dBµV/m)	3

5.16 Spurious Emissions - radiated (Receiver) § 15.109

Modulation: GFSK

Plot 1: 0.03 - 1 GHz vertical & horizontal polarization (receiver)

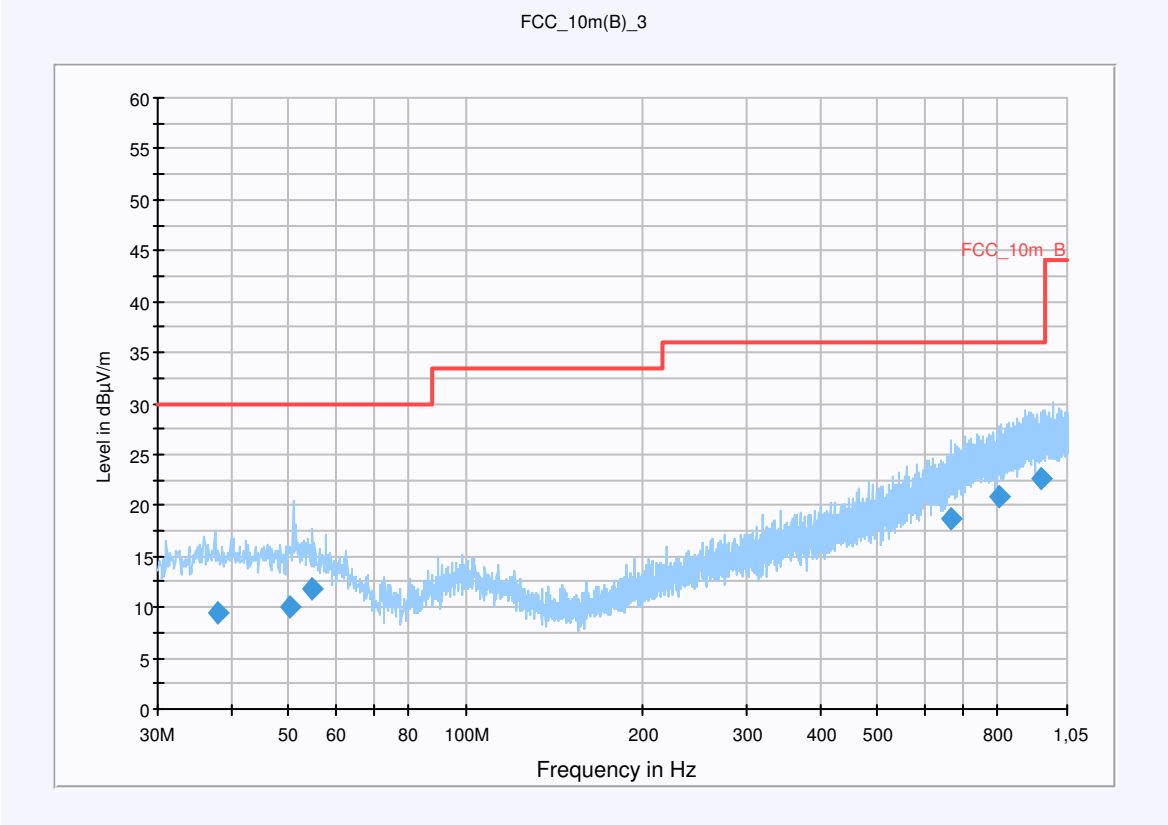
Common Information

EUT:	RCW41GW
Serial Number:	IMEI: 004401.13.588929.9
Test Description:	FCC Part 15C
Operating Conditions:	BT RX
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



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
37.927050	9.5	15000.000	120.000	214.0	V	210.0	13.3	20.5	30.0	
50.352600	10.0	15000.000	120.000	105.0	V	31.0	13.3	20.0	30.0	
55.022850	11.9	15000.000	120.000	143.0	V	48.0	12.9	18.1	30.0	
667.799400	18.7	15000.000	120.000	173.0	V	132.0	21.5	17.3	36.0	
807.101250	20.9	15000.000	120.000	98.0	H	187.0	23.9	15.1	36.0	
946.402950	22.6	15000.000	120.000	220.0	V	324.0	25.3	13.4	36.0	

Hardware Setup: **EMI radiated\Electric Field (NOS) - [EMI radiated]**

	Subrange 1
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

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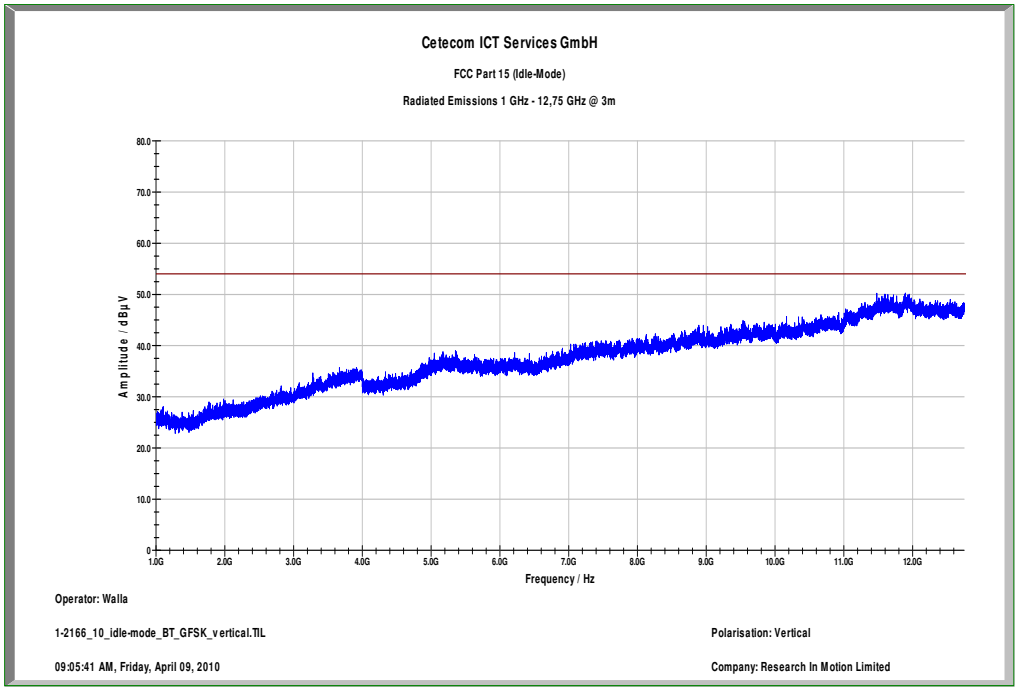
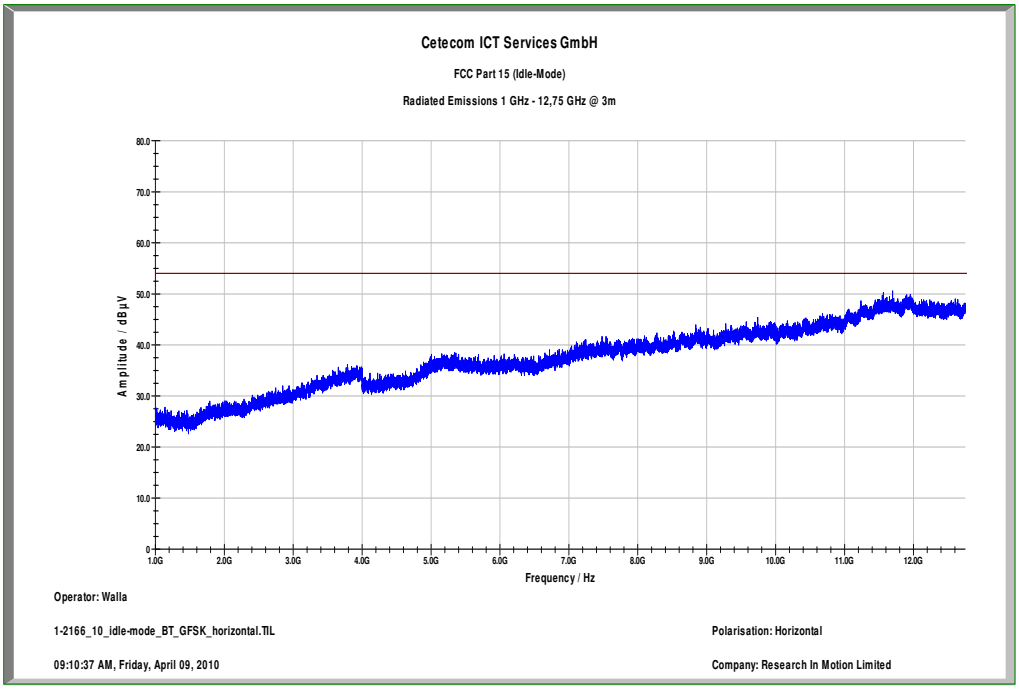
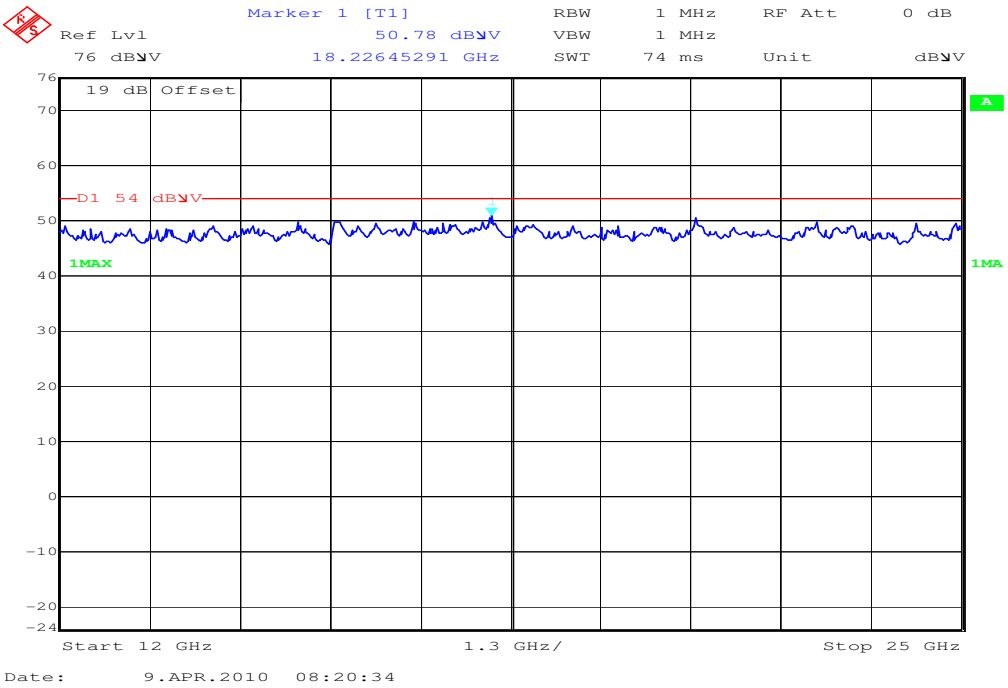
Plot 2: 1 – 12.75 GHz vertical polarization (receiver)



Plot 3: 1 – 12.75 GHz horizontal polarization (receiver)



Plot 4: 12 - 25 GHz vertical & horizontal polarization (receiver)



Measurement distance see table

Limits: § 15.109

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
30 - 88	100 (40 dBµV/m)	3
88 - 216	150 (43.5 dBµV/m)	3
216 - 960	200 (46 dBµV/m)	3
above 960	500 (54 dBµV/m)	3

Modulation: 8 DPSK

Plot 1: 0.03 - 1 GHz vertical & horizontal polarization (receiver)

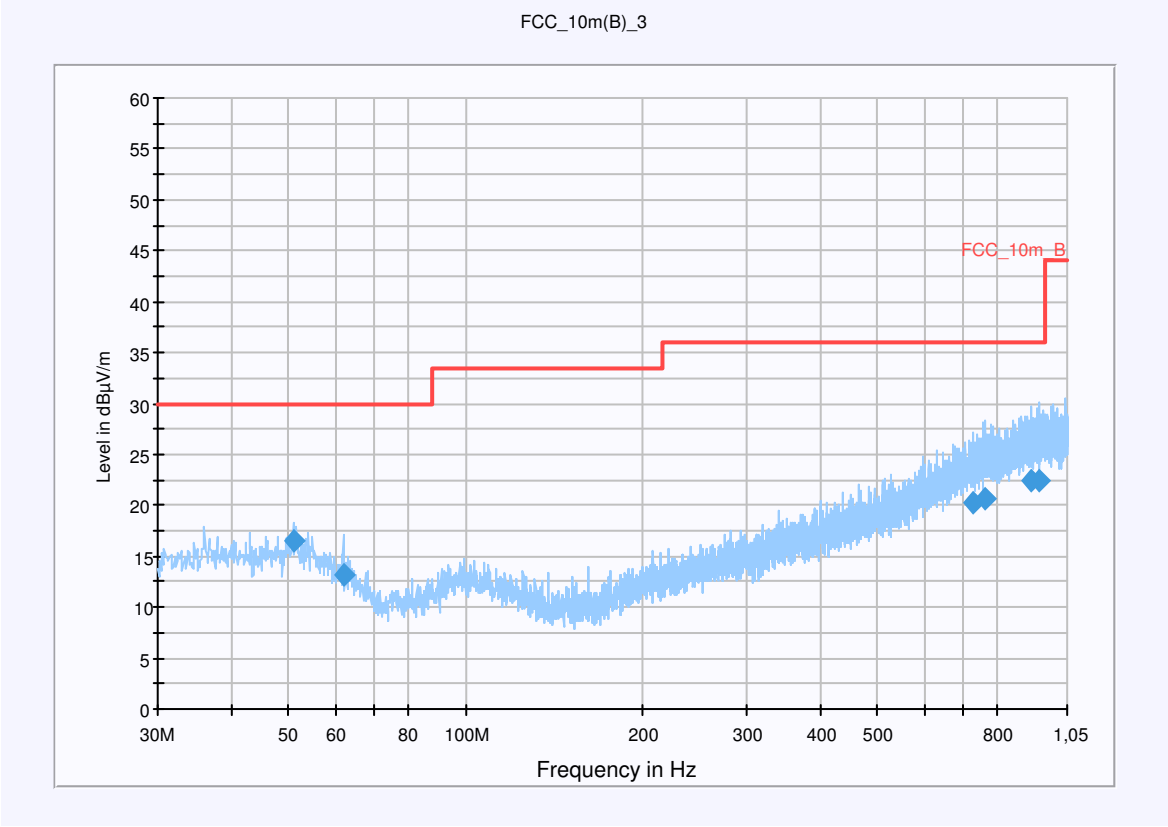
Common Information

EUT:	RCW41GW
Serial Number:	IMEI: 004401.13.588929.9
Test Description:	FCC Part 15C
Operating Conditions:	BT 3DH5 RX
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



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
50.981850	16.5	15000.000	120.000	98.0	V	191.0	13.3	13.5	30.0	
61.999350	13.2	15000.000	120.000	98.0	V	145.0	11.1	16.8	30.0	
726.843000	20.3	15000.000	120.000	220.0	V	248.0	23.1	15.7	36.0	
762.899250	20.7	15000.000	120.000	180.0	V	143.0	23.7	15.3	36.0	
912.439800	22.4	15000.000	120.000	113.0	V	160.0	25.2	13.6	36.0	
944.570400	22.5	15000.000	120.000	112.0	V	291.0	25.3	13.5	36.0	

Hardware Setup: **EMI radiated\Electric Field (NOS) - [EMI radiated]**

	Subrange 1
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

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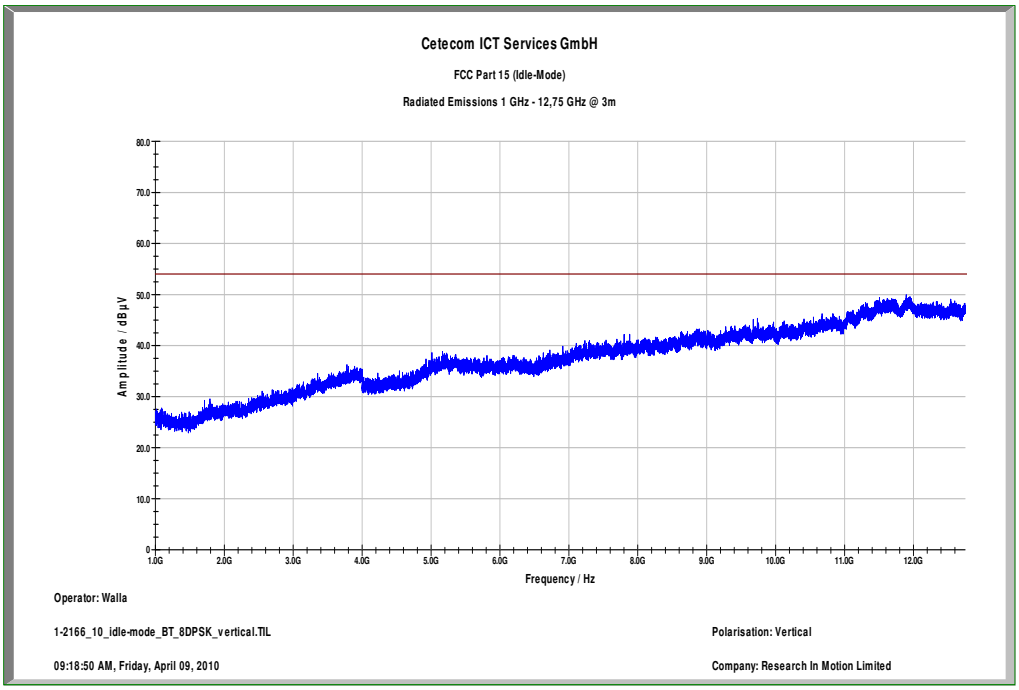
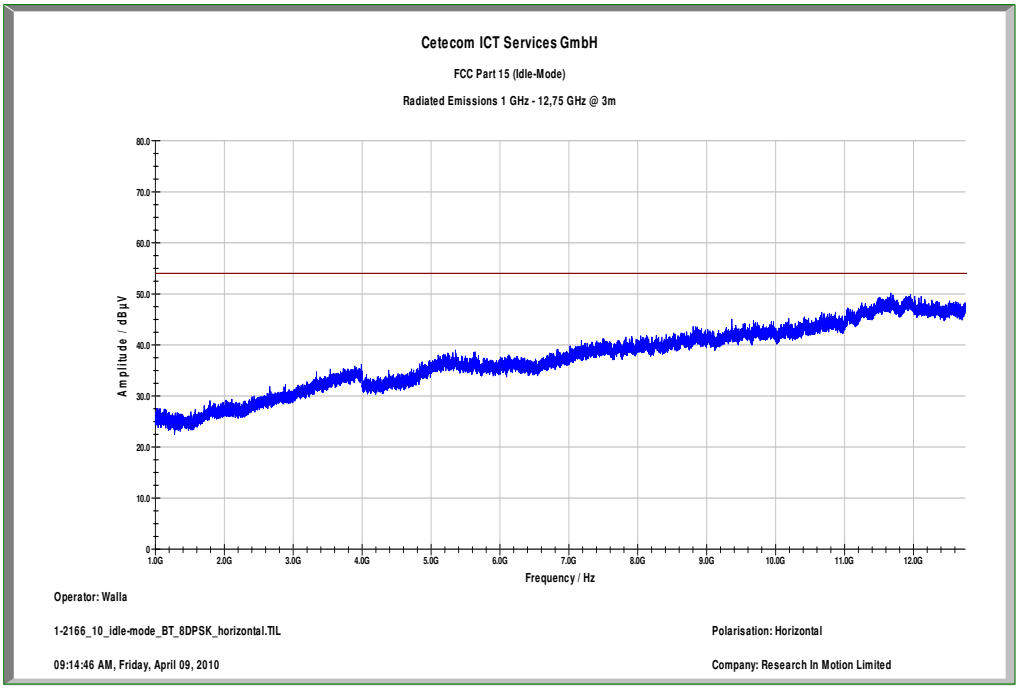
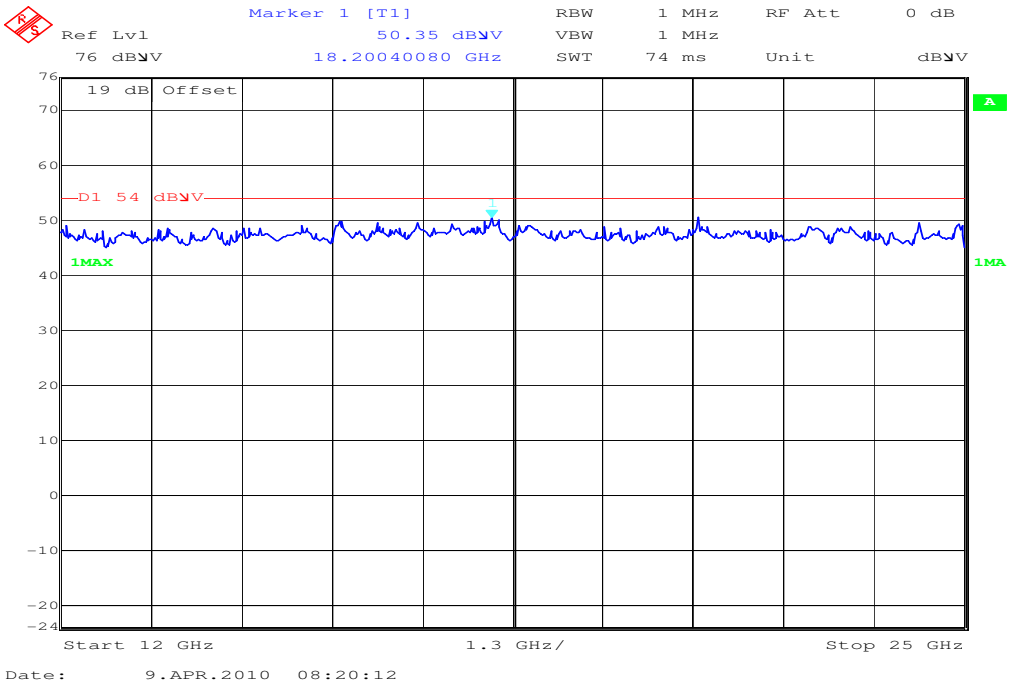
Plot 2: 1 – 12.75 GHz vertical polarization (receiver)



Plot 3: 1 – 12.75 GHz horizontal polarization (receiver)



Plot 4: 12 - 25 GHz vertical & horizontal polarization (receiver)



Measurement distance see table

Limits: § 15.109

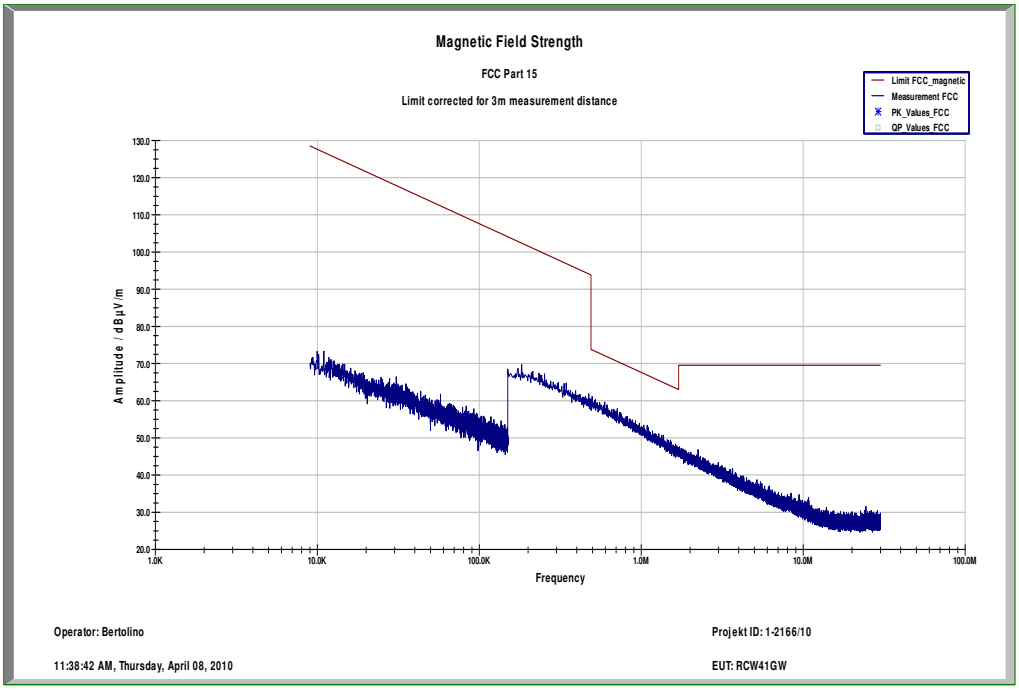
Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
30 - 88	100 (40 dBµV/m)	3
88 - 216	150 (43.5 dBµV/m)	3
216 - 960	200 (46 dBµV/m)	3
above 960	500 (54 dBµV/m)	3

5.17 Spurious Emissions < 30 MHz - Transmitter radiated § 15.209

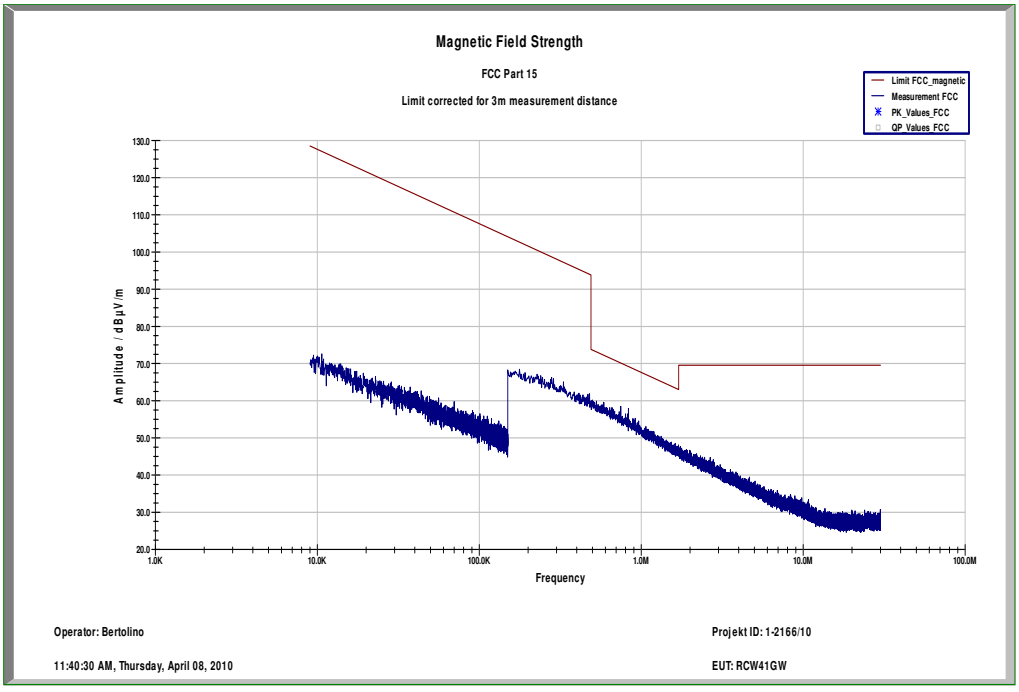
Modulation: valid for all modes

Measured at 3 m distance.
Values recalculated with 40 dB/decade according to FCC rules.

Plot 1: TX mode, GFSK / 8DPSK modulation



Plot 2: RX mode



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

5.18 Conducted Emissions <30 MHz § 15.107/207

Not performed

Modulation: GFSK

Plot 1:

Limits:

Under normal test conditions only	See plots

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.	Labor / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kal. Art	Last Calibration	Next Calibration
1	n. a.	System Autoranging DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	08.01.2009	08.01.2012
2	n. a.	PowerAttenuator	8325	Byrd	1530	300001595			
3	n. a.	Double-Ridged Waveguide Horn Antenna 1-26.5GHz	3115	EMCO	8812-3088	300001032	vl KI !	05.03.2009	05.03.2011
4	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
5	n. a.	Anechoic chamber		MWB	87400/02	300000996			
6	Spec.A. 2_2e	System-Rack	85900	HP I.V.	*	300000222	ne		
7	9	Artificial Mains 9 kHz to 30 MHz, 4 x 25 Ampere	ESH3-Z5	R&S	828576/020	300001210	Ve	06.01.2010	06.01.2012
8	n. a.	Relais Matrix	3488A	HP Meßtechnik	2719A15013	300001156	ne		
9	n. a.	Relais Matrix	PSU	R&S	890167/024	300001168	ne		
10	n. a.	Isolating Transformer	RT5A	Grundig	9242	300001263	ne		
11	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
12	n. a.	Switch / Control Unit	3488A	HP	2605e08770	300001443	ne		
13	n. a.	Band Reject filter	WRCG1855/1910-1835/1925-40/8SS	Wainwright	7	300003350	ev		
14	n. a.	Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
15	n. a.	TILE-Software Emission	Quantum Change, Modell TILE-ICS/FULL	EMCO	none	300003451	ne		
16	n. a.	Highpass Filter	WHKX2.9/18G-12SS	Wainwright	1	300003492	ev		
17	n. a.	Highpass Filter	WHK1.1/15G-10SS	Wainwright	3	300003255	ev		
18	n. a.	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne		
19	n. a.	PSA Spectrum Analyzer 3 Hz - 26.5 GHz	E4440A	Agilent Vertr. Bad Hom	MY48250080	300003812	k	05.08.2008	05.08.2010
20	n. a.	MXG Microwave Analog Signal Generator	N5183A	Agilent Vertr. Bad Hom	MY47420220	300003813	k	06.08.2008	06.08.2010
21	n. a.	RF Filter Section 9kHz - 1GHz	N9039A	Agilent Vertr. Bad Hom	MY48260003	300003825	vl KI !	19.08.2008	19.08.2010
22	n. a.	TRILOG Super Breitband Antenne	VULB9163	Schwarzbeck	371	300003854	vl KI !	17.12.2008	17.12.2010
23	n. a.	CBT (Bluetooth EDR Signalisierung)	CBT 1153.9000K35, CBT-B55, CBT-K55	R&S	100313	300003516	k	03.09.2008	03.09.2010