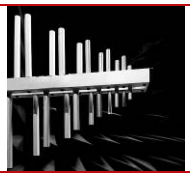
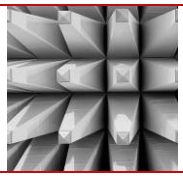




CETECOM™
CETECOM ICT Services
consulting - testing - certification

TEST REPORT

DAkkS Deutsche Akkreditierungsstelle D-PL-12076-01-01

Test report no.: 1-3016-01-03/11-A

Testing laboratory

CETECOM ICT Services GmbH
Untertuerkheimer Strasse 6 – 10
66117 Saarbruecken / Germany
Phone: + 49 681 5 98 - 0
Fax: + 49 681 5 98 - 9075
Internet: http://www.cetecom.com
e-mail: ict@cetecom.com

Accredited test laboratory:
The test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025
DAR registration number: D-PL-12076-01-01

Area of Testing: Radio/Satellite Communications

Applicant

Research In Motion Limited
305 Phillip Street
Waterloo, ON N2L 3W8 / Canada
Phone: +1-519-888-7465
Fax: +1-519-888-6906
Contact: Masud Attayi
e-mail: mattayi@rim.com
Phone: +1-519-888-7465

Manufacturer

Research In Motion Limited
305 Phillip Street
Waterloo, ON N2L 3W8 / Canada

Test standard	Version	Test standard description
47 CFR Part 15	2009-10	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices

Test item

Kind of test item:	**Blackberry GSM Phones**
Model name:	**RDU71CW Rev 1 (until 2011-02-23)** **RDU71CW Rev 2 (after 2011-02-23)**
Frequency:	**ISM band 2400 – 2483.5 MHz** **(lowest channel 2402 MHz – highest channel 2480 MHz)**
FCC ID **IC**	**L6ARDU70CW** **2503A-RDU70CW**
Power supply:	**3.7V DC by Lithium battery**
Temperature range:	**+22 °C**

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test performed:

cn=Stefan Boes, o=Cetecom ICT Services GmbH, ou=BOE-100817, email=Stefan.Boes@cetecom.com, c=DE
2011.07.05 15:26:16 +02'00'

Stefan Bös

Test report authorised:

cn=Marco Bertolino, o=CETECOM ICT Services GmbH, ou=BTL-100826, email=marco.bertolino@cetecom.com, c=DE
2011.07.05 15:13:33 +02'00'

Marco Bertolino

1 Table of contents

2 General information

2.1 Notes

The test results of this test report relate exclusively to the test item specified in this test report. 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 CETECOM ICT Services GmbH.
This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

2.2 Application details

Date of receipt of order:	2011-02-02
Date of receipt of test item:	2011-02-02
Start of test:	2011-02-02
End of test:	2011-04-12
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Version	Test standard description
47 CFR Part 15	2009-10	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices

4 Test environment

Temperature:	T_{nom}	+22	°C during room temperature test
	T_{max}	-/-	°C during high temperature test
	T_{min}	-/-	°C during low temperature test
Relative humidity content:		45 %	
Air pressure:		not relevant for this kind of testing	
Power supply:	V_{nom}	3.7 V	Lithium battery
	V_{max}	-/- V	
	V_{min}	-/- V	

5 Test item

Kind of test item	:	Blackberry GSM Phones
Type identification	:	RDU71CW Rev 1 (until 2011-02-23) RDU71CW Rev 2 (after 2011-02-23)
IMEI		004401.13.759465.7
S/N serial number	:	MEID-HEX A000002587BB8C
HW/ SW hardware status	:	HW: Rev 2 SW: 5.0.0.48
Frequency band [MHz]	:	ISM band 2400 – 2483.5 MHz (lowest channel 2402 MHz – highest channel 2480 MHz)
Type of modulation	:	FHSS technology with GFSK, Pi/4 DQPSK and 8 DPSK.
Number of channels	:	79
Antenna	:	Integrated antenna
Power supply	:	3.7 V DC by Lithium battery
Temperature range	:	22 °C

6 Test laboratories sub-contracted

None

7 Summary of measurement results

☒ **No deviations from the technical specifications were ascertained**

☐ There were deviations from the technical specifications ascertained

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	CFR Part 15	Passed	2011-07-05	Tests according customer demand

Test specification clause	Test case	Temperature conditions	Power source voltages	Mode	Pass	Fail	NA	NP	Results (max.)
§15.247(b)(4) RSS 210 / A8.4(2)	Antenna gain	Nominal	Nominal	GFSK	☐	☐	☐	☒	
§15.247(e) RSS 210 / A8.2(b)	Power spectral density	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☐	☐	☐	☒	
§15.247(a)(1) RSS 210 / A8.1(b)	Carrier frequency separation	Nominal	Nominal	GFSK	☐	☐	☐	☒	
§15.247(a)(1) RSS 210 / A8.1(d)	Number of hopping channels	Nominal	Nominal	GFSK	☐	☐	☐	☒	
§15.247(a)(1) (iii) RSS 210 / A8.3(1)	Time of occupancy (dwell time)	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☐	☐	☐	☒	
§15.247(a)(1) RSS 210 / A8.2(a)	Spectrum bandwidth of a FHSS system 20dB bandwidth	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	☒ ☒ ☒	
§15.247(b)(1) RSS-210 / A8.4(2)	Maximum output power	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	☒ ☒ ☒	
§15.247(d) RSS-210 / A8.5	Band edge compliance conducted	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	☒ ☒ ☒	
§15.205 RSS-210 / A8.5	Band edge compliance radiated	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☒ ☒ ☒	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	complies
§15.247(d) RSS-210 / A8.5	TX spurious emissions conducted	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	☒ ☒ ☒	
§15.247(d) RSS-210 / A8.5	TX spurious emissions radiated	Nominal	Nominal	GFSK	☒	☐	☐	☐	complies
§15.109 RSS-Gen.	RX spurious emissions radiated	Nominal	Nominal	-/-	☐	☐	☐	☒	
§15.209(a) RSS-Gen	TX spurious emissions radiated < 30 MHz	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☒ ☒ ☒	☐	☐	☐ ☐ ☐	complies
§15.107(a)	Conducted emissions < 30 MHz	Nominal	Nominal	GFSK	☐	☐	☐	☒	

Note: NA = Not Applicable; NP = Not Performed

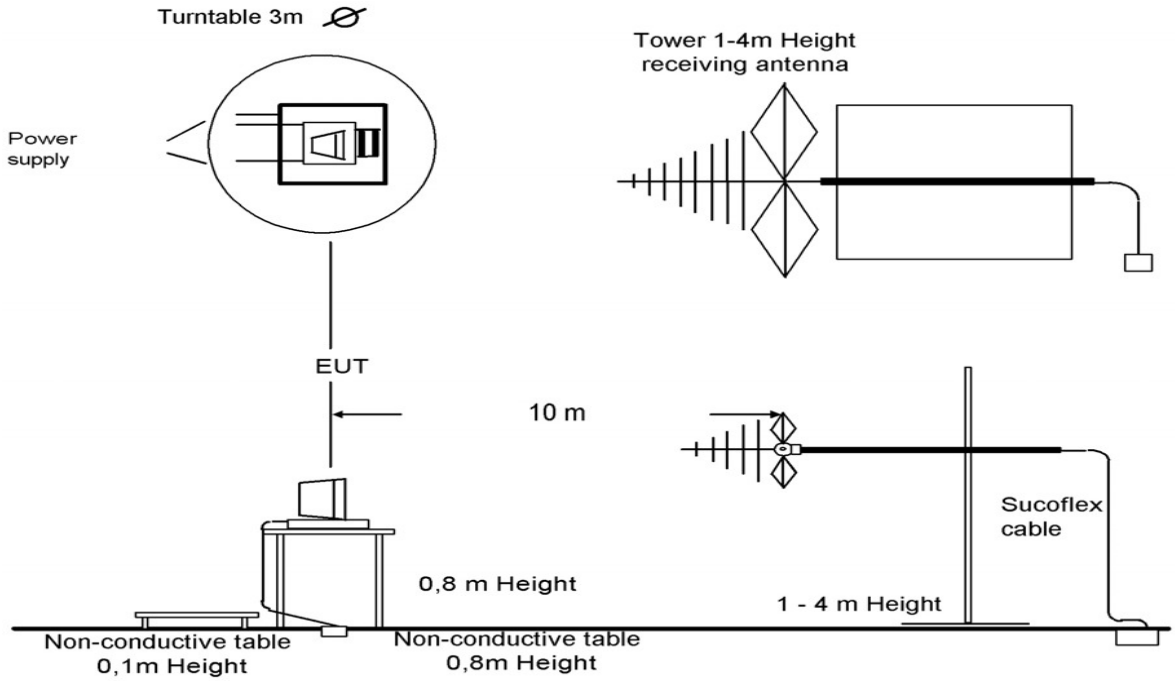
8 RF measurement testing

8.1 Description of test setup

8.1.1 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 C63.4-2009 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 C63-4-2009 clause 4.2.
Antennas are confirmed with ANSI C63.2-1996 item 15.

Semi anechoic chamber



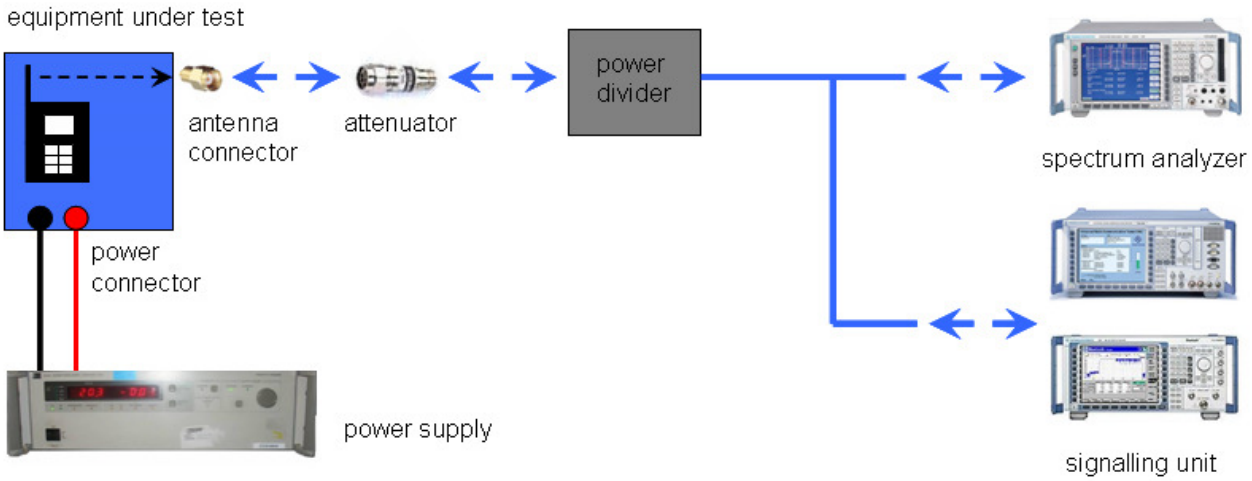
Picture 1: Diagram radiated measurements

9 kHz - 30 MHz:	active loop antenna
30 MHz – 1 GHz:	tri-log antenna
> 1 GHz:	horn antenna

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.

8.1.2 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.



Picture 2: Diagram conducted measurements

8.2 Additional comments

The Bluetooth® word mark and logos are owned by the Bluetooth SIG Inc. and any use of such marks by Cetecom ICT Services GmbH is under license.

Reference documents: None

Special test descriptions: None

Configuration descriptions: TX tests: were performed with x-DH5 packets and static PRBS pattern payload.
RX/Standby tests: BT test mode enabled, scan enabled, TX Idle

Test mode:

☒ Bluetooth Test mode loop back enabled
(EUT is controlled over CBT/CMU)

☐ Special software is used.
EUT is transmitting pseudo random data by itself

9 Measurement results

9.1 Band edge compliance radiated

Description:

Measurement of the radiated band edge compliance. The EUT is turned in the position that results in the maximum level at the band edge. Then a sweep over the corresponding restricted band is performed. The EUT is set to single channel mode and the transmit channel is channel 00 for the lower restricted band and channel 78 for the upper restricted band. The measurement is repeated for all modulations. Measurement distance is 3m.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Video bandwidth:	10 Hz
Resolution bandwidth:	1 MHz
Span:	Lower Band: 2300 – 2400 MHz Higher Band: 2480 – 2500 MHz
Trace-Mode:	Max Hold

Limits:

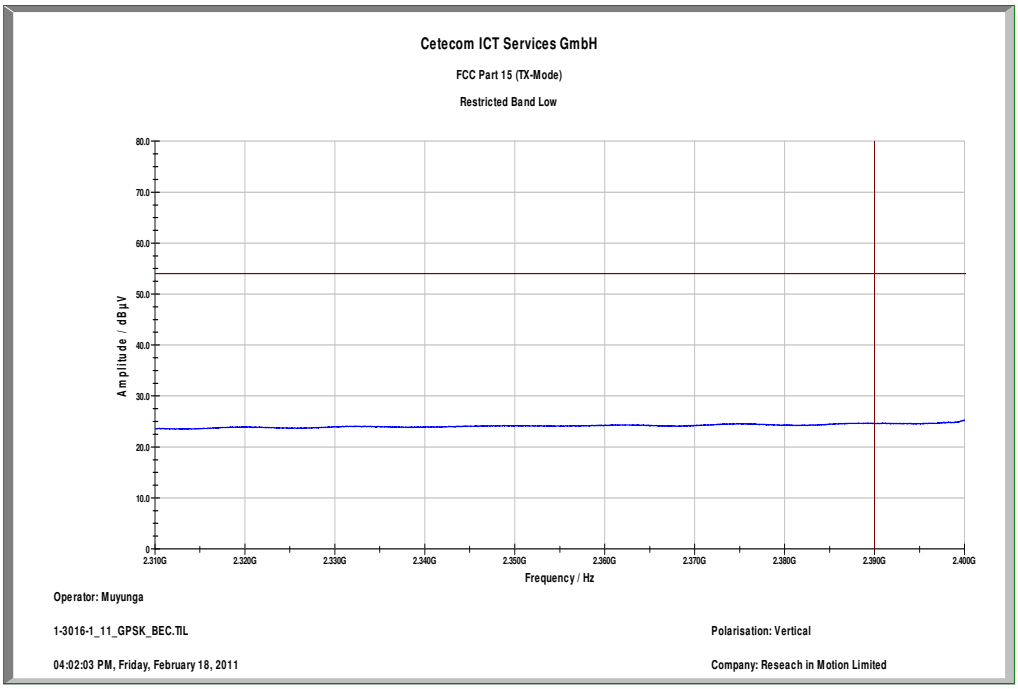
FCC	IC
CFR Part 15.205	-/-
Band edge compliance radiated	
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that 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)).	
54 dBµV/m AVG	

Result:

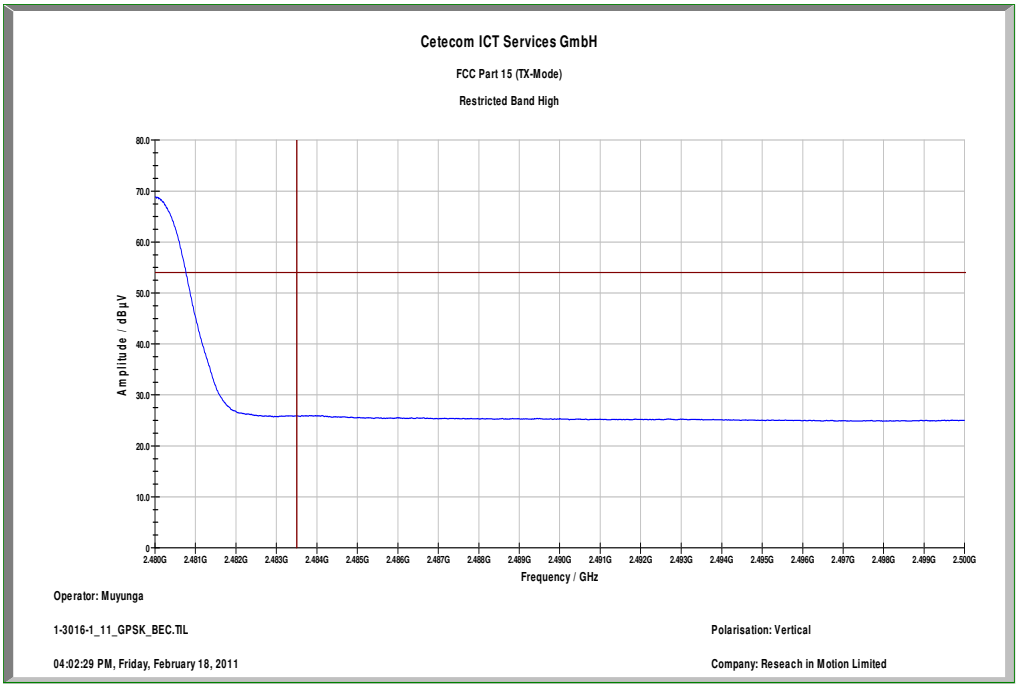
Szenario	Band edge compliance radiated [dBµV/m]		
Modulation	GFSK	Pi/4 DQPSK	8DPSK
Lower restricted band	< 54 (see plot 1)	< 54 (see plot 3)	< 54 (see plot 5)
Upper restricted band	< 54 (see plot 2)	< 54 (see plot 4)	< 54 (see plot 6)
Measurement uncertainty	± 3 dB		

Result: **The result of the measurement is passed.**

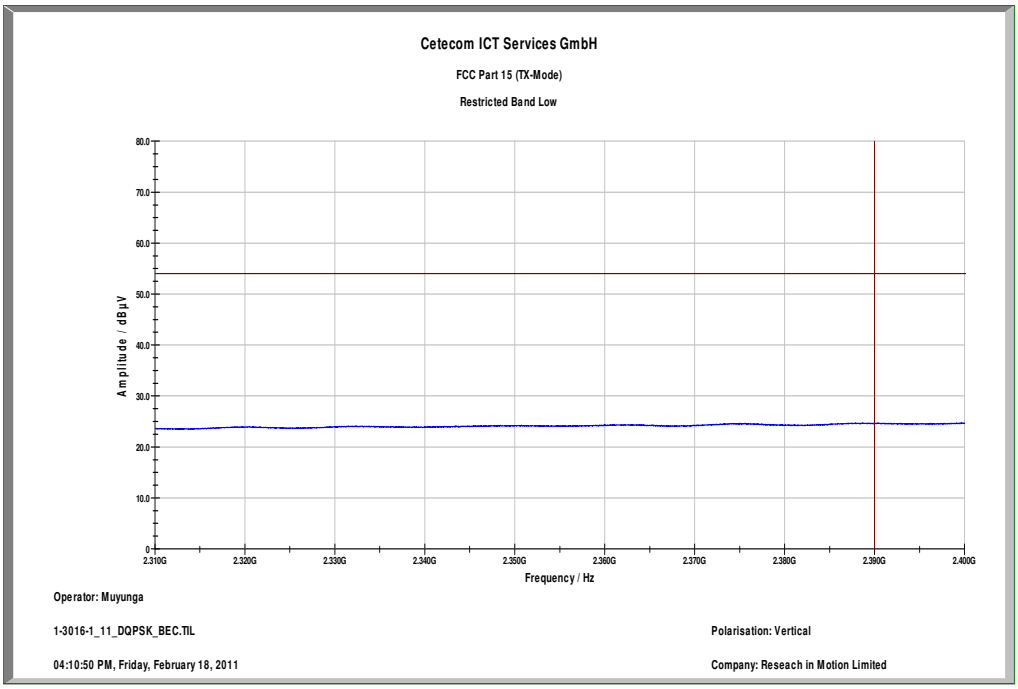
Plot 1: Lower Restricted Band / GFSK (radiated)



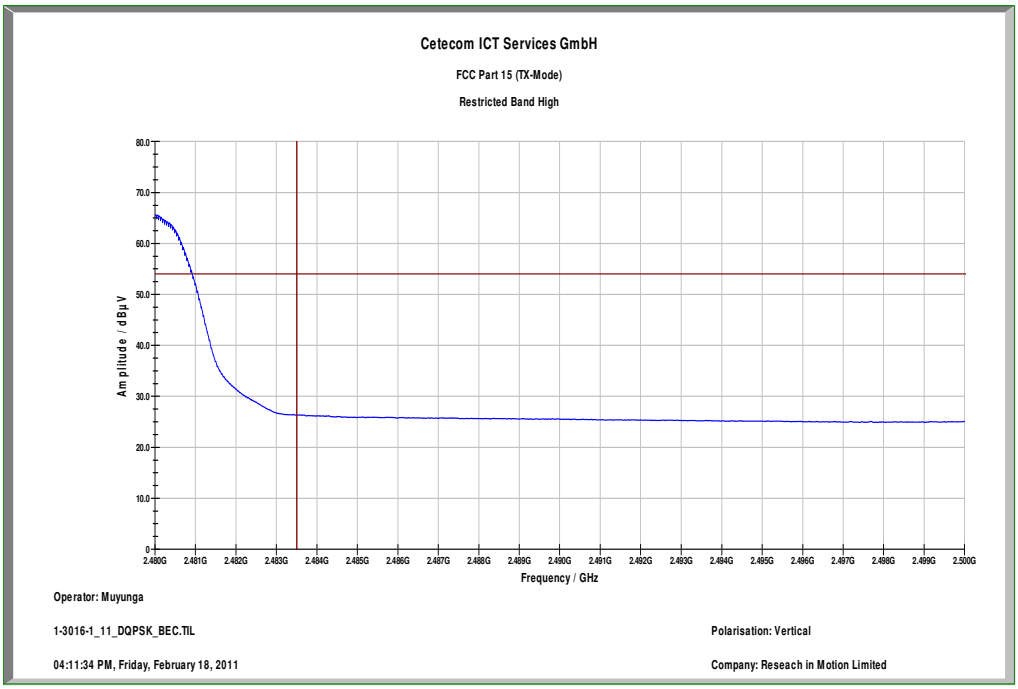
Plot 2: Upper Restricted Band / GFSK (radiated)



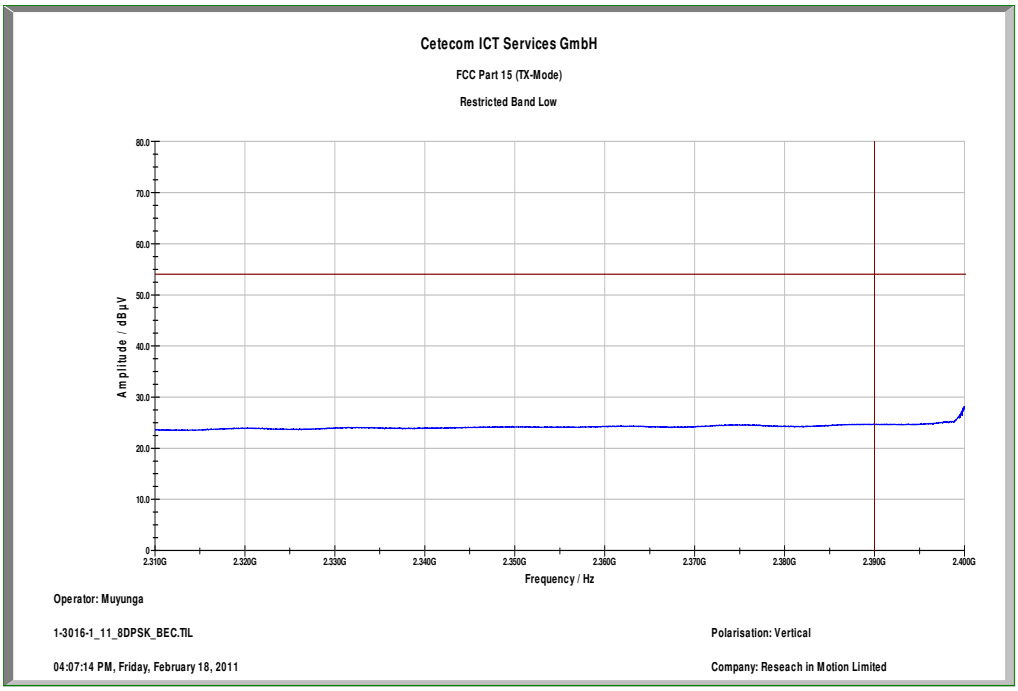
Plot 3: Lower Restricted Band / Pi/4 DQPSK (radiated)



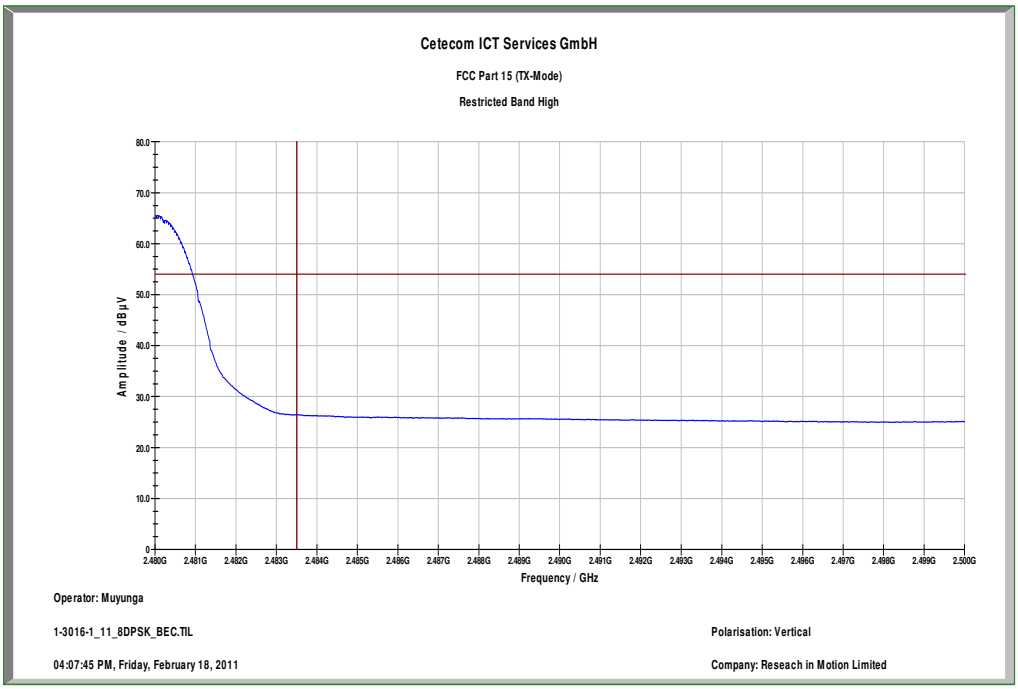
Plot 4: Upper Restricted Band / Pi/4 DQPSK (radiated)



Plot 5: Lower Restricted Band / 8DPSK (radiated)



Plot 6: Upper Restricted Band / 8DPSK (radiated)



9.2 TX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in transmit mode. The EUT is set to single channel mode and the transmit channel is channel 00, channel 39 and channel 78. The measurement is performed in the mode with the highest output power.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak
Sweep time:	Auto
Video bandwidth:	Sweep: 100 kHz Remeasurement: 10 Hz
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 1 MHz
Span:	30 MHz to 25 GHz
Trace-Mode:	Max Hold
Measured Modulation:	☒ GFSK ☒ Pi/4 DQPSK ☒ 8DPSK

Limits:

FCC	IC
CFR Part 15.247(d)	-/-
TX spurious emissions radiated	
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 §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).	

§15.209		
Frequency (MHz)	Field strength (dBµV/m)	Measurement distance
30 - 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3

Result: **Also see plots**

TX spurious emissions radiated [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 critical peaks found			No critical peaks found			No critical peaks found		
Measurement uncertainty			± 3 dB					

Result: **The result of the measurement is passed.**

Plot 1: 30 MHz to 1 GHz / channel 00 (vertical/ horizontal), GFSK

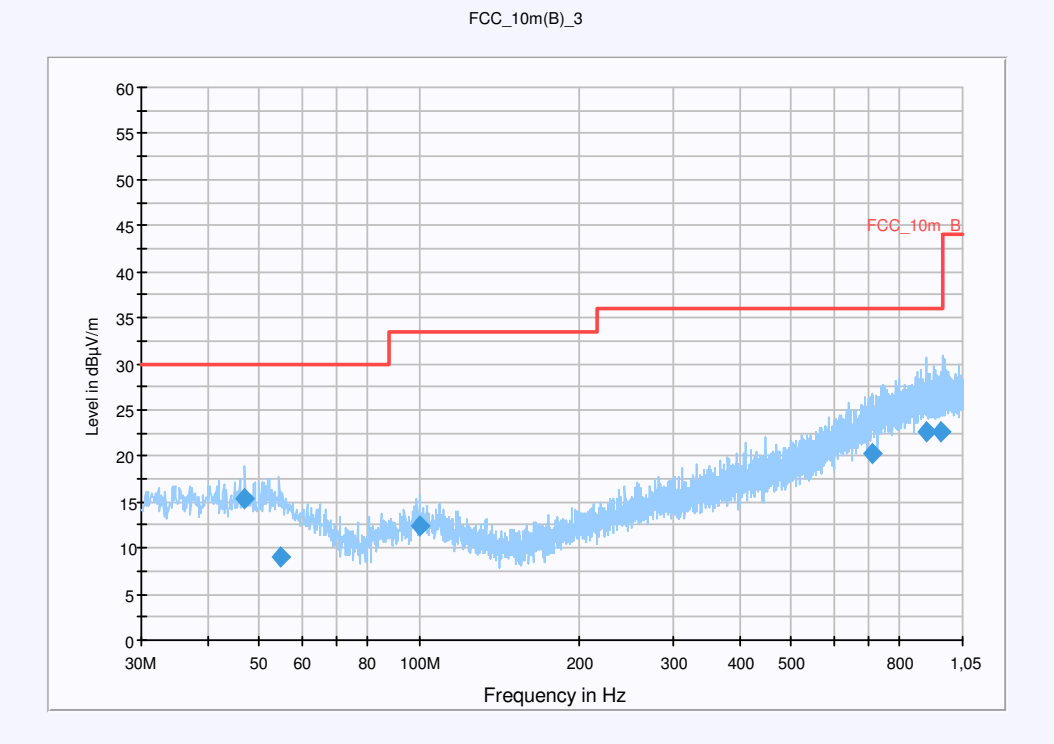
Common Information

EUT:	RDU71CW
Serial Number:	FCC EMI Sample 2 | IMEI: 004401.13.748274.7
Test Description:	FCC Part 15
Operating Conditions:	BT (GFSK) Ch.: 0 + charging
Operator Name:	Wittenmeier
Comment:	AC: 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

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

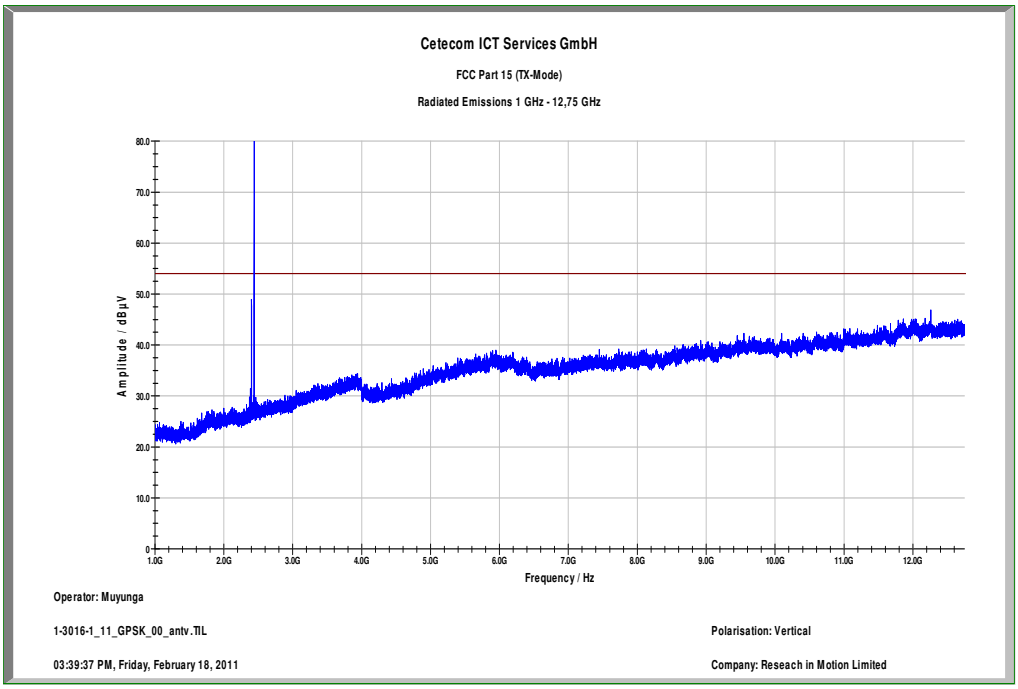
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



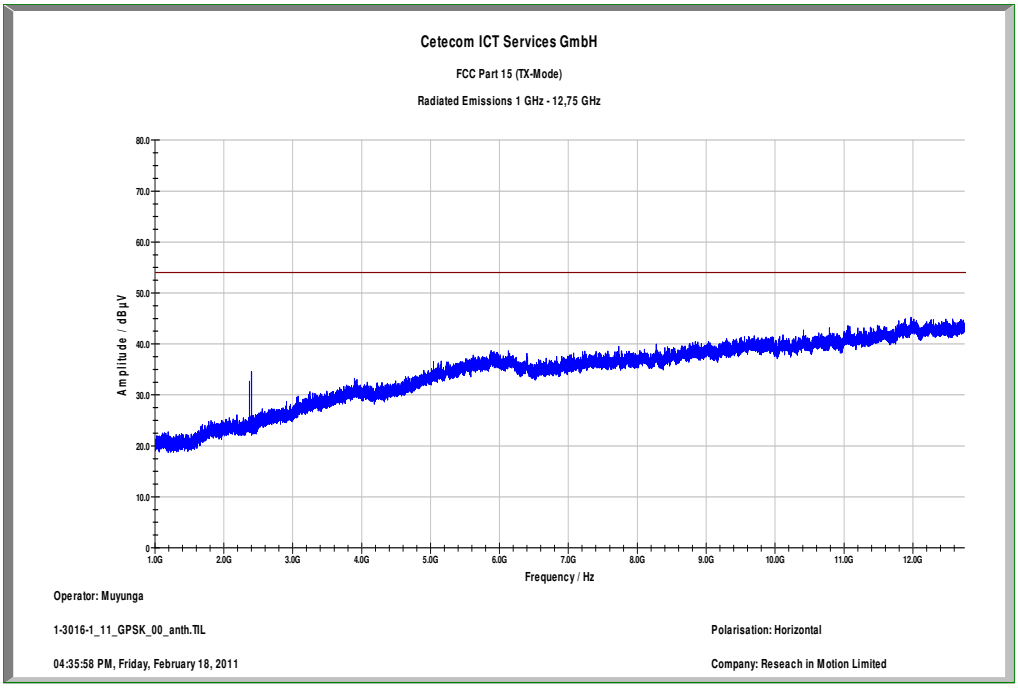
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
46.985400	15.3	15000.000	120.000	98.0	V	45.0	13.3	14.7	30.0
54.805950	9.0	15000.000	120.000	225.0	V	260.0	12.9	21.0	30.0
100.033800	12.4	15000.000	120.000	132.0	V	75.0	11.9	21.1	33.5
709.420950	20.2	15000.000	120.000	199.0	H	324.0	22.7	15.8	36.0
898.799400	22.6	15000.000	120.000	98.0	V	243.0	25.2	13.4	36.0
959.524800	22.7	15000.000	120.000	114.0	V	304.0	25.4	13.3	36.0

Plot 2: 1 GHz to 12.75 GHz / channel 00 (vertical), GFSK

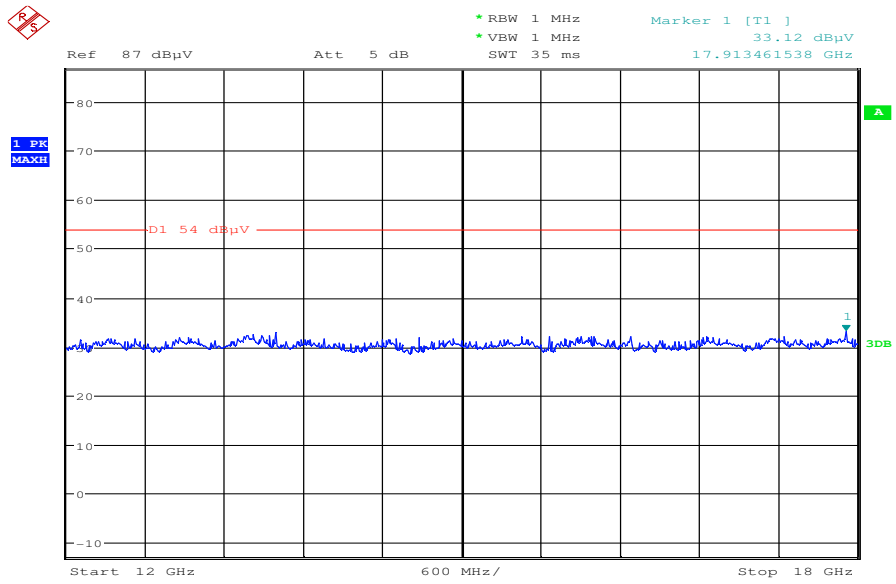


Plot 3: 1 GHz to 12.75 GHz / channel 00 (horizontal), GFSK



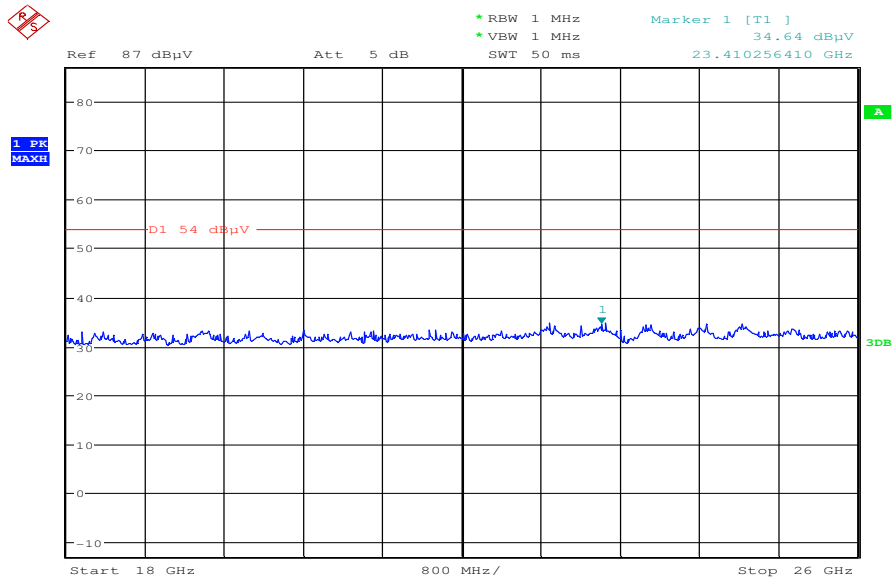
Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 4: 12 GHz to 18 GHz / channel 00 (horizontal/vertical), GFSK



Date: 1.MAR.2011 17:42:24

Plot 5: 18 GHz to 26 GHz / channel 00 (horizontal/vertical), GFSK



Date: 1.MAR.2011 17:35:18

Plot 6: 30 MHz to 1 GHz / channel 39 (vertical/ horizontal), GFSK

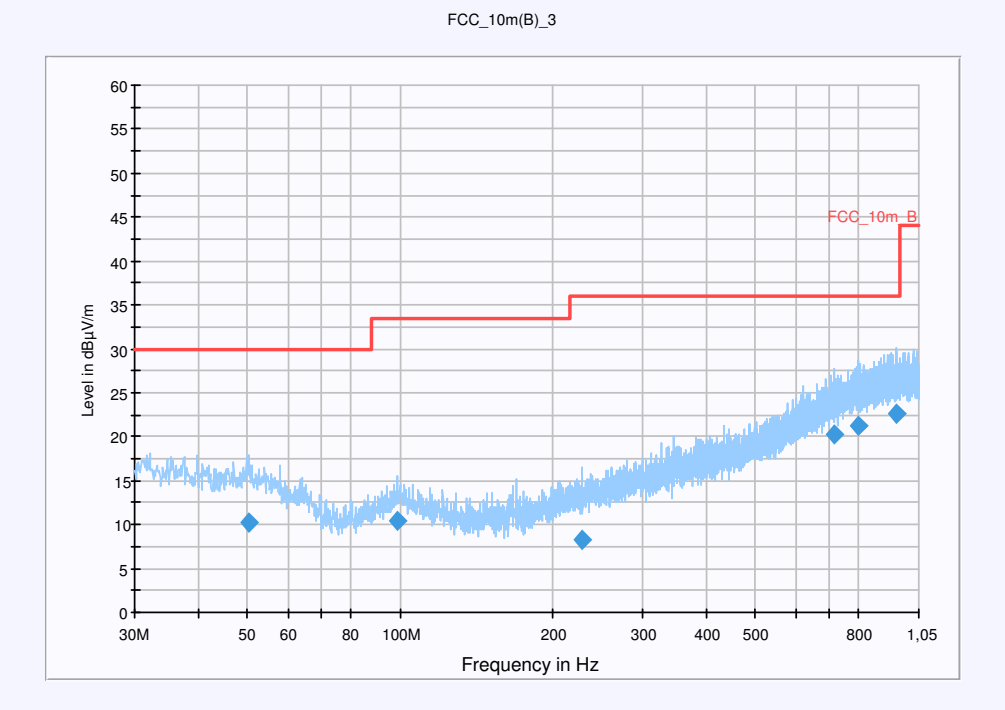
Common Information

EUT:	RDU71CW REV 2
Serial Number:	FCC EMI Sample 24 | IMEI: 004401.13.759445.9
Test Description:	FCC Part 15
Operating Conditions:	BT (GFSK) Ch.: 39 + charging
Operator Name:	Wittenmeier
Comment:	AC: 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

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

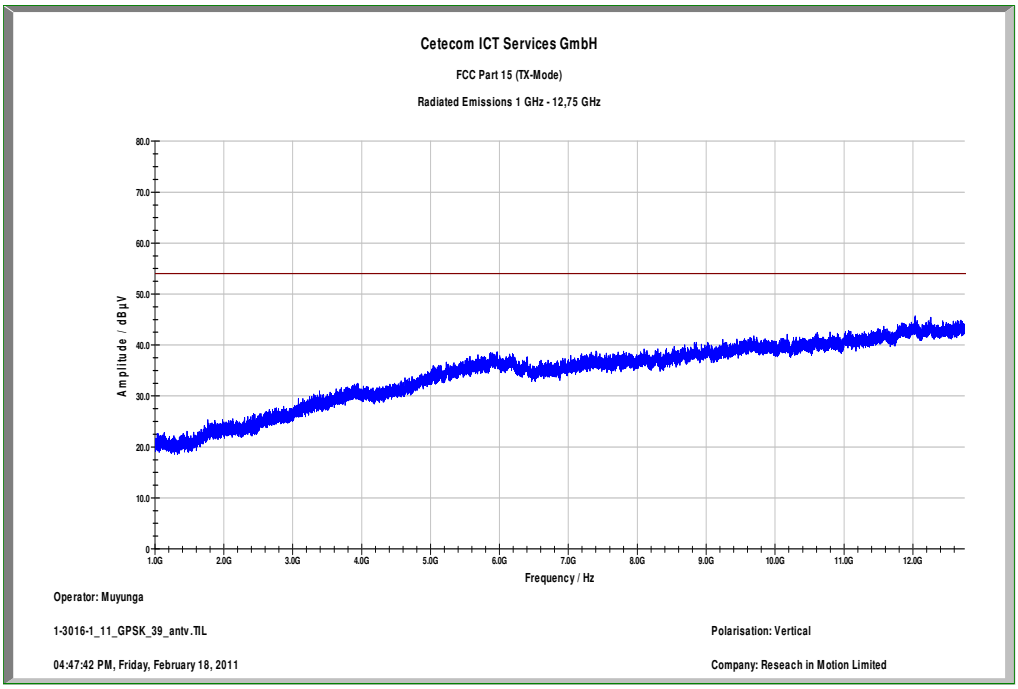
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



Final Result 1

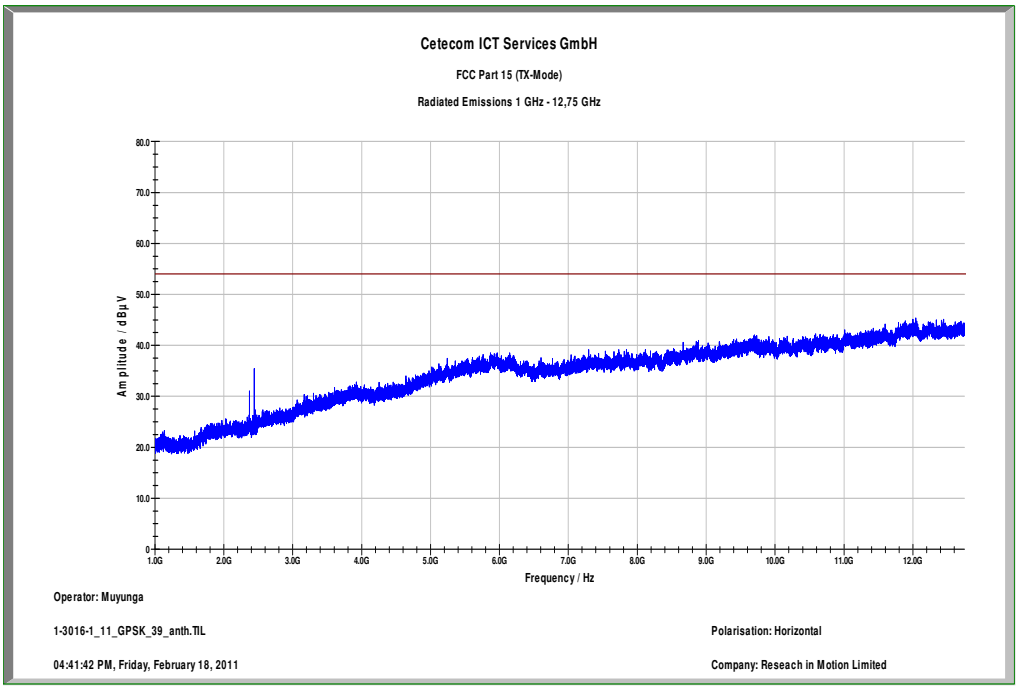
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
50.282850	10.2	15000.000	120.000	98.0	V	201.0	13.3	19.8	30.0
98.996250	10.5	15000.000	120.000	131.0	V	162.0	11.8	23.0	33.5
227.840700	8.3	15000.000	120.000	220.0	V	-5.0	12.6	27.7	36.0
715.211550	20.3	15000.000	120.000	165.0	H	90.0	22.9	15.7	36.0
801.017850	21.2	15000.000	120.000	220.0	V	174.0	23.8	14.8	36.0
951.760500	22.6	15000.000	120.000	118.0	V	197.0	25.4	13.4	36.0

Plot 7: 1 GHz to 12.75 GHz / channel 39 (vertical), GFSK



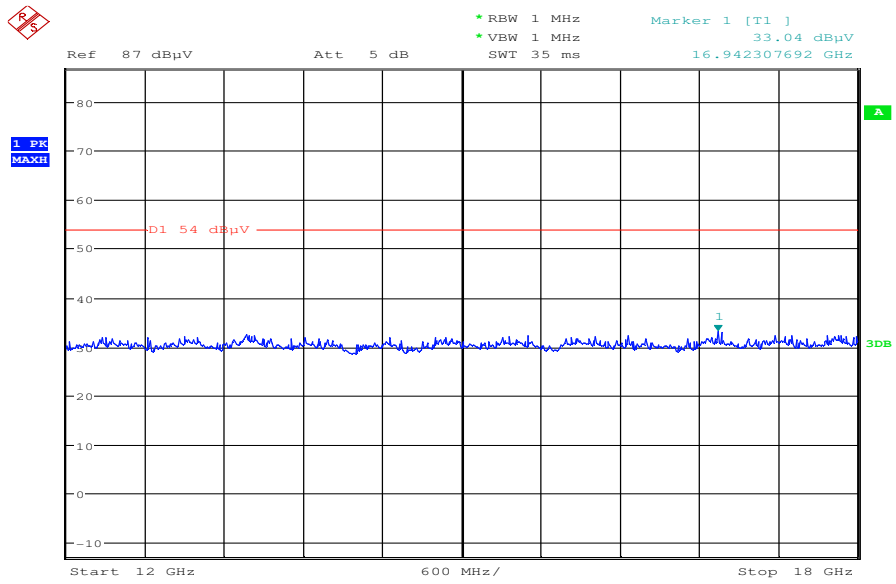
Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 8: 1 GHz to 12.75 GHz / channel 39 (horizontal), GFSK



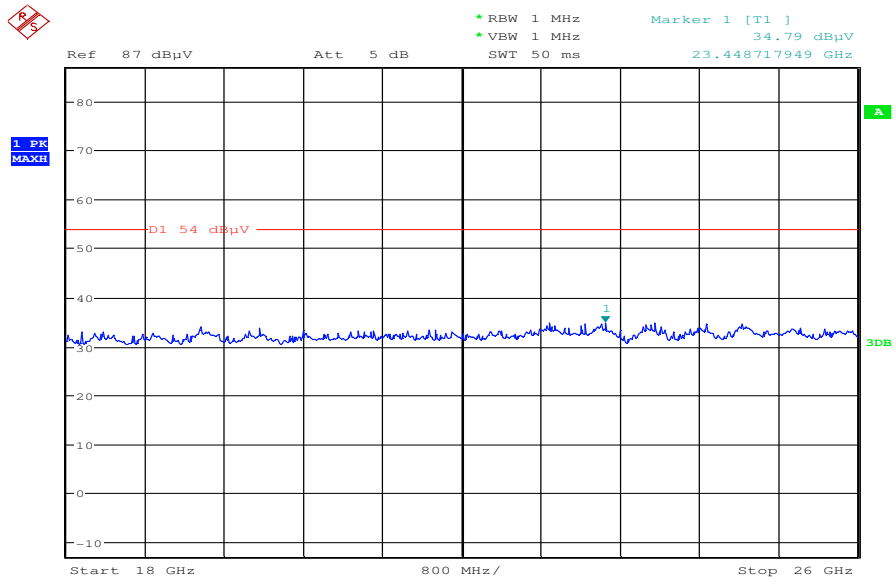
Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 9: 12 GHz to 18 GHz / channel 39 (horizontal/vertical), GFSK



Date: 1.MAR.2011 17:42:59

Plot 10: 18 GHz to 26 GHz / channel 39 (horizontal/vertical), GFSK



Date: 1.MAR.2011 17:35:41

Plot 11: 30 MHz to 1 GHz / channel 78 (vertical), GFSK

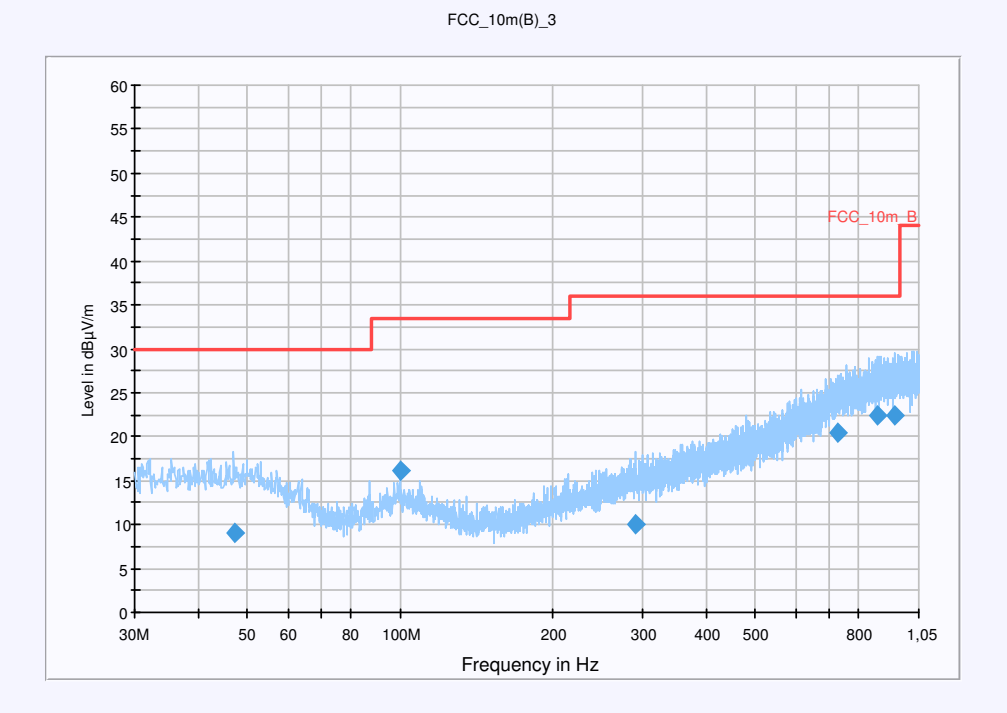
Common Information

EUT:	RDU71CW REV 2
Serial Number:	FCC EMI Sample 24 IMEI: 004401.13.759445.9
Test Description:	FCC Part 15
Operating Conditions:	BT (GSFK) Ch.: 78 + charging
Operator Name:	Wittenmeier
Comment:	AC 115V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

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

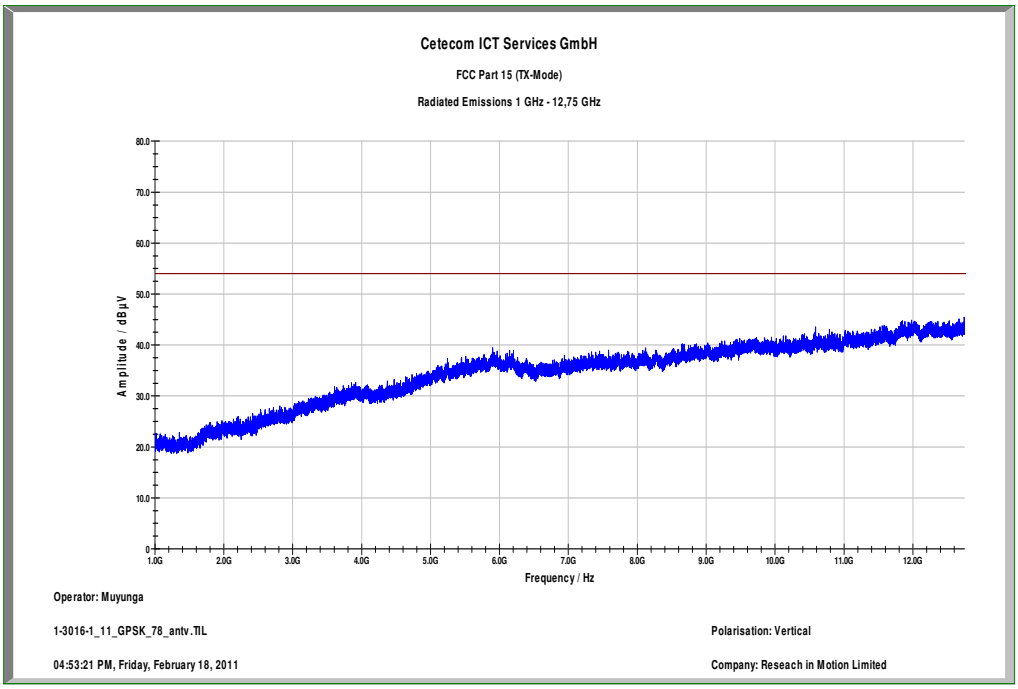
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



Final Result 1

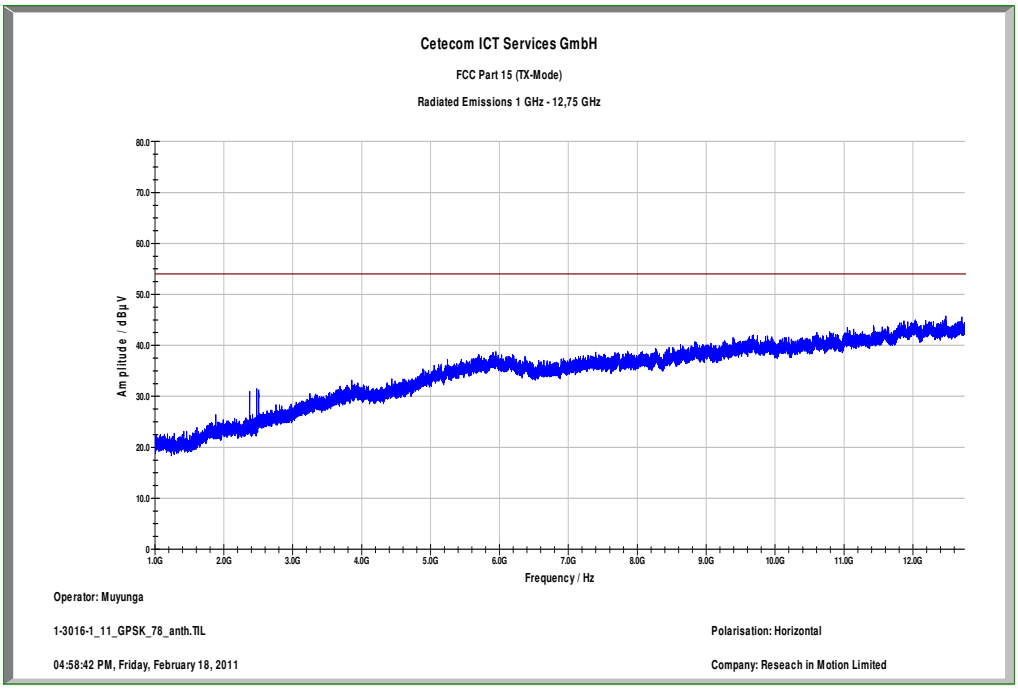
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
47.182650	9.1	15000.000	120.000	111.0	V	23.0	13.3	20.9	30.0
99.978450	16.2	15000.000	120.000	117.0	V	60.0	11.9	17.3	33.5
290.162400	10.1	15000.000	120.000	218.0	H	294.0	14.3	25.9	36.0
725.377650	20.5	15000.000	120.000	149.0	H	120.0	23.1	15.5	36.0
872.876400	22.3	15000.000	120.000	218.0	V	216.0	24.9	13.7	36.0
938.645100	22.4	15000.000	120.000	218.0	H	310.0	25.3	13.6	36.0

Plot 12: 1 GHz to 12.75 GHz / channel 78 (vertical), GFSK



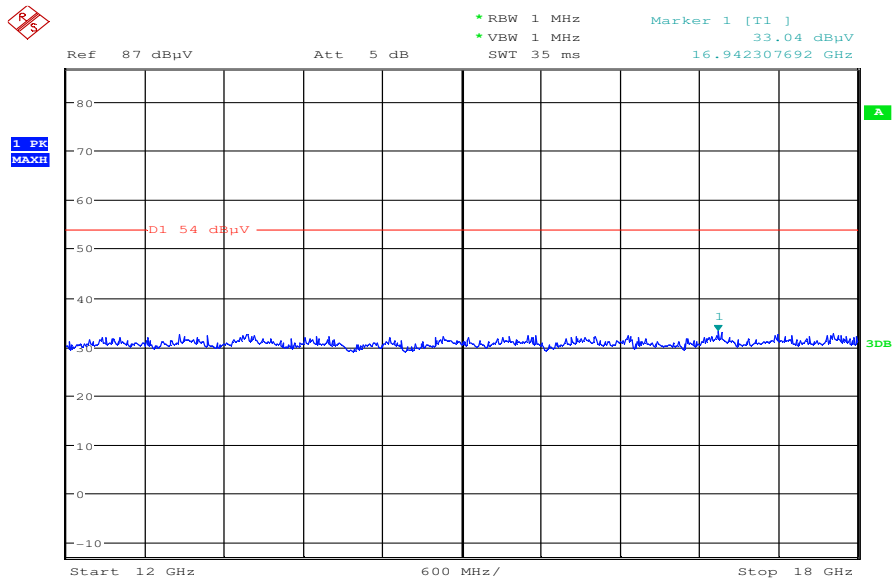
Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 13: 1 GHz to 12.75 GHz / channel 78 (horizontal), GFSK



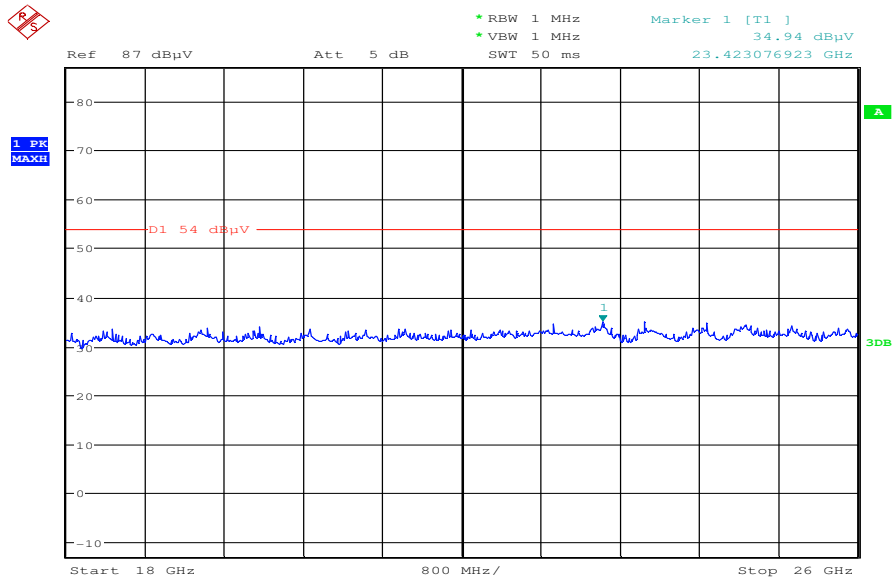
Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 14: 12 GHz to 18 GHz / channel 78 (horizontal/vertical), GFSK



Date: 1.MAR.2011 17:43:25

Plot 15: 18 GHz to 26 GHz / channel 78 (horizontal/vertical), GFSK



Date: 1.MAR.2011 17:36:35

Plot 16: 30 MHz to 1 GHz / channel 00 (vertical), Pi/4-DQPSK

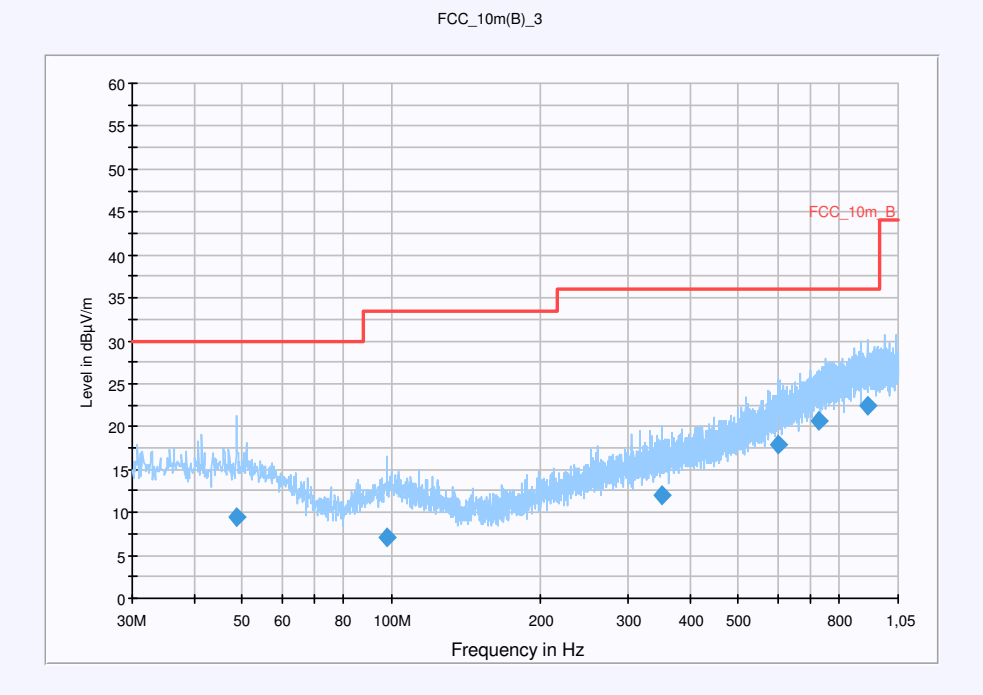
Common Information

EUT:	RDU71CW REV 2
Serial Number:	FCC EMI Samole 24 IMEI:004401.13.759445.9
Test Description:	FCC Part 15
Operating Conditions:	BT (pi/4 DQPSK) CH.:0 +charging
Operator Name:	Wittenmeier
Comment:	AC 115V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

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

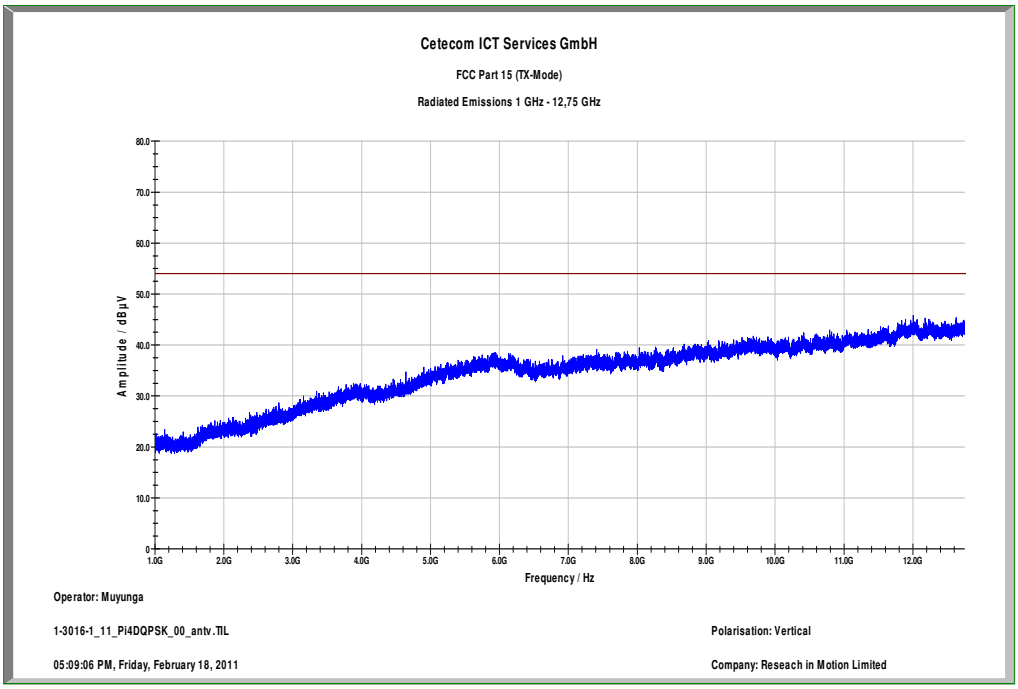
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



Final Result 1

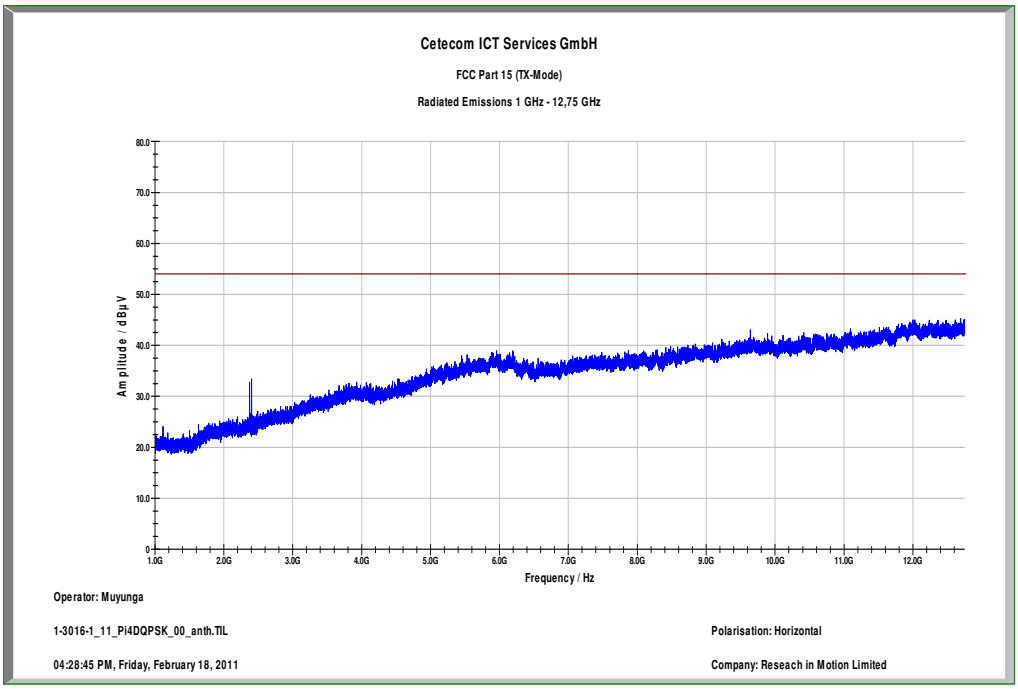
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
48.774750	9.4	15000.000	120.000	220.0	V	52.0	13.3	20.6	30.0
97.753500	7.1	15000.000	120.000	169.0	H	317.0	11.6	26.4	33.5
350.066700	12.0	15000.000	120.000	220.0	V	245.0	16.1	24.0	36.0
602.895750	17.9	15000.000	120.000	220.0	V	-1.0	20.8	18.1	36.0
727.079400	20.6	15000.000	120.000	98.0	V	98.0	23.1	15.4	36.0
915.255000	22.5	15000.000	120.000	98.0	H	40.0	25.2	13.5	36.0

Plot 17: 1 GHz to 12.75 GHz / channel 00 (vertical), Pi/4-DQPSK



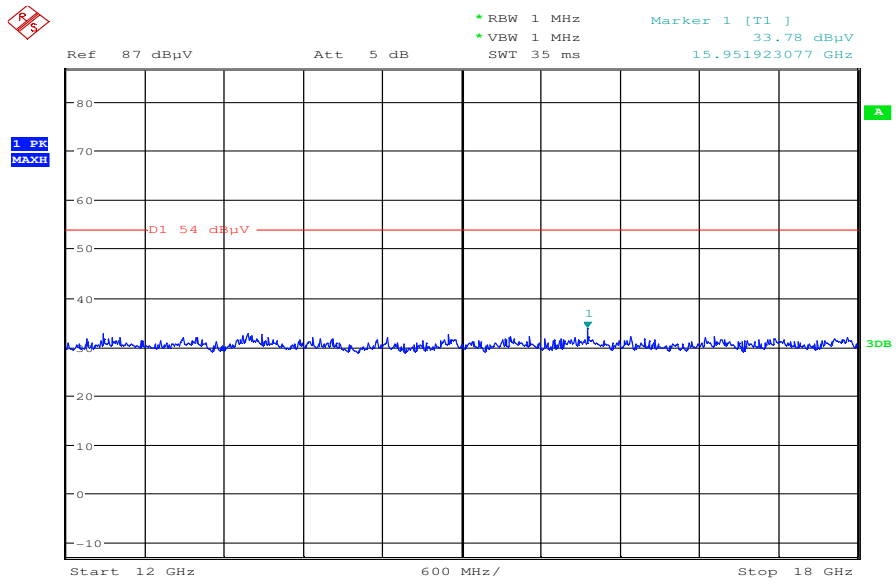
Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 18: 1 GHz to 12.75 GHz / channel 00 (horizontal), Pi/4-DQPSK



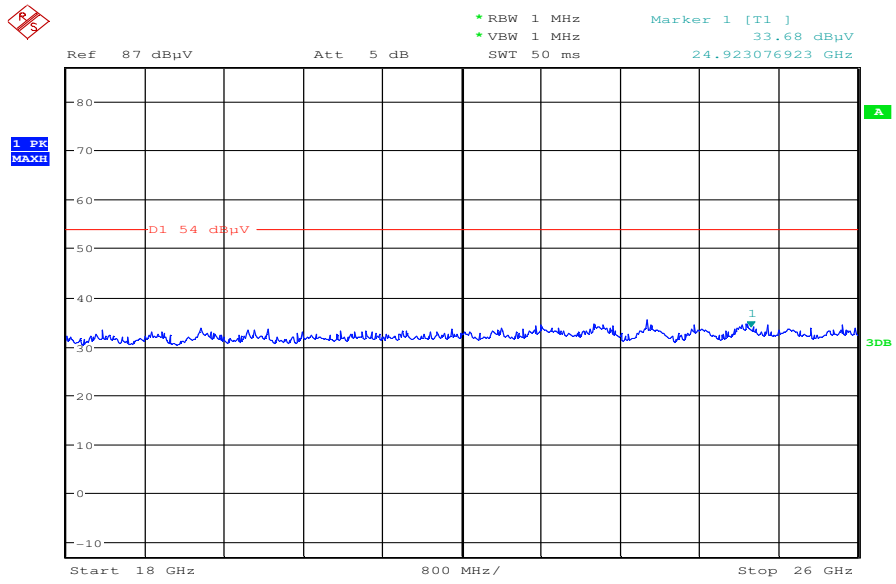
Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 19: 12 GHz to 18 GHz / channel 00 (horizontal/vertical), Pi/4-DQPSK



Date: 1.MAR.2011 17:43:58

Plot 20: 18 GHz to 26 GHz / channel 00 (horizontal/vertical), Pi/4-DQPSK



Date: 1.MAR.2011 17:37:53

Plot 21: 30 MHz to 1 GHz / channel 39 (vertical), Pi/4-DQPSK

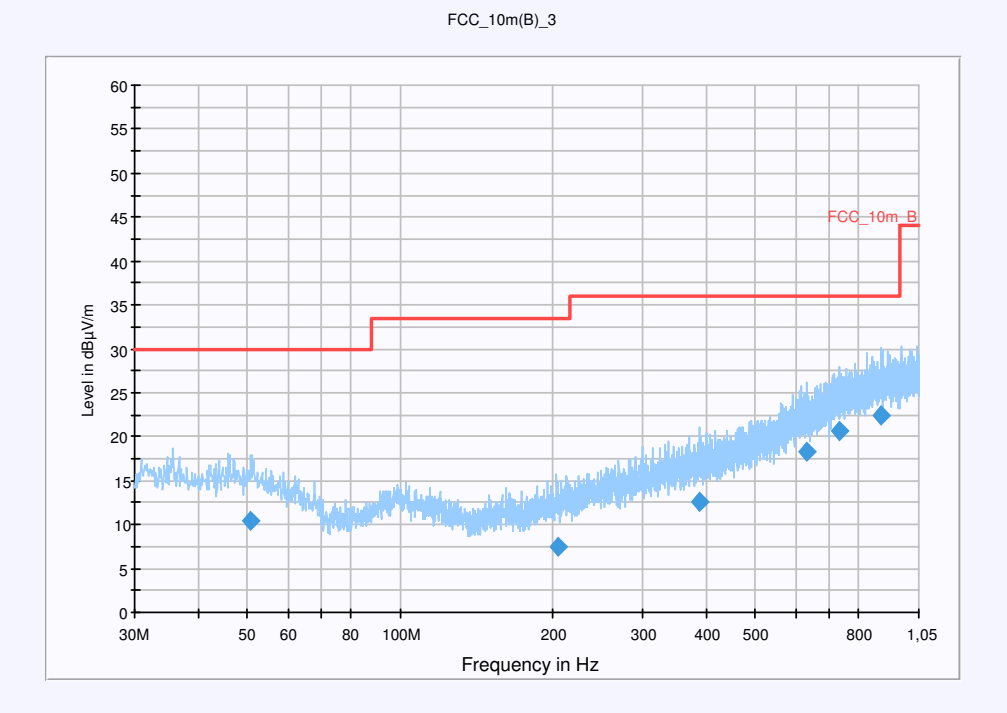
Common Information

EUT:	RDU71CW REV2
Serial Number:	FCC EMI Sample 24 IMEI:004404.13.759445.9
Test Description:	FCC Part 15
Operating Conditions:	BT (pi/4 DQPSK) Ch. 39 +charging
Operator Name:	Wittenmeier
Comment:	AC 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

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

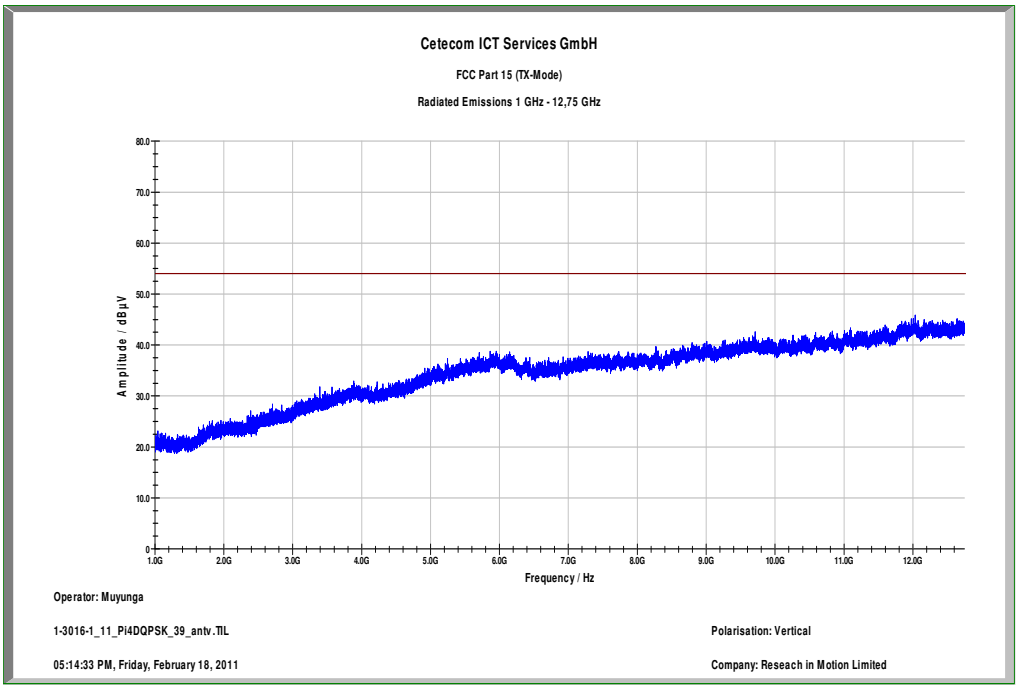
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



Final Result 1

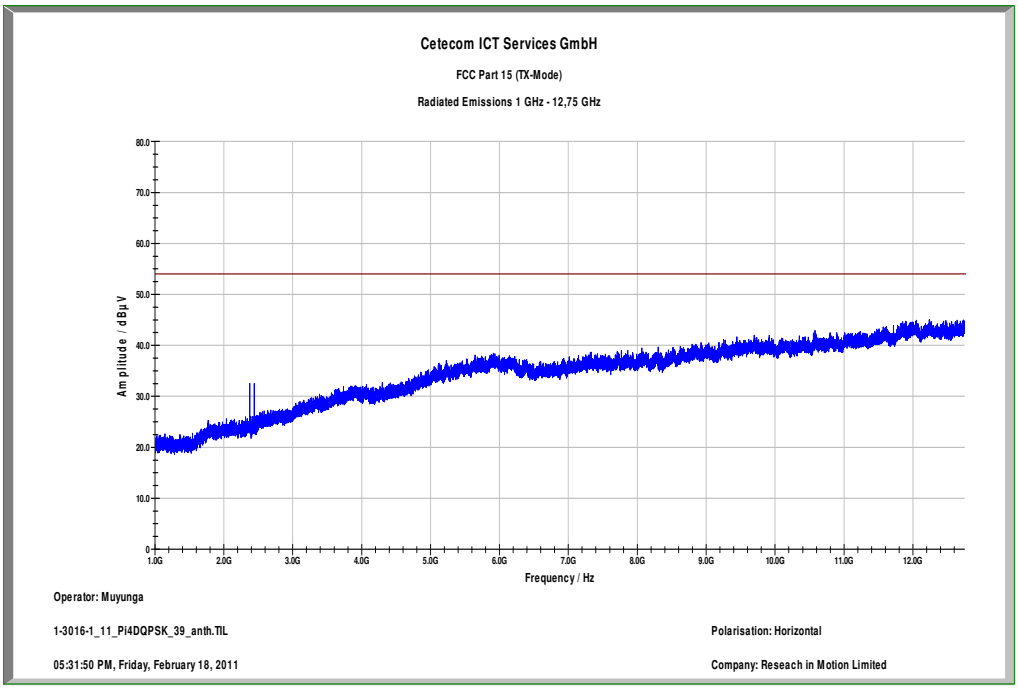
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
50.830500	10.4	15000.000	120.000	220.0	V	324.0	13.3	19.6	30.0
204.008850	7.5	15000.000	120.000	220.0	H	216.0	11.8	26.0	33.5
388.418100	12.5	15000.000	120.000	117.0	H	262.0	16.7	23.5	36.0
629.667300	18.4	15000.000	120.000	220.0	V	245.0	21.0	17.6	36.0
735.227700	20.7	15000.000	120.000	98.0	V	89.0	23.3	15.3	36.0
880.959150	22.4	15000.000	120.000	212.0	H	183.0	25.0	13.6	36.0

Plot 22: 1 GHz to 12.75 GHz / channel 39 (vertical), Pi/4-DQPSK



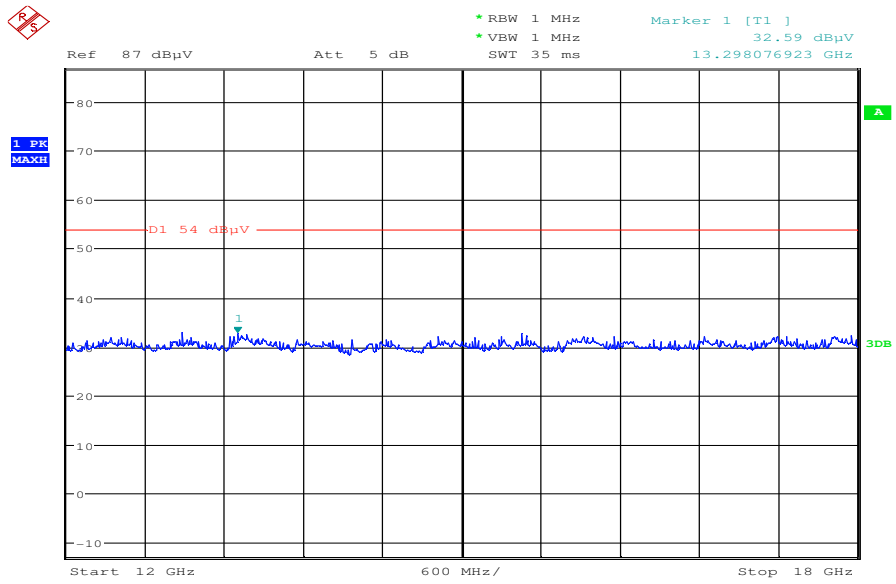
Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 23: 1 GHz to 12.75 GHz / channel 39 (horizontal), Pi/4-DQPSK



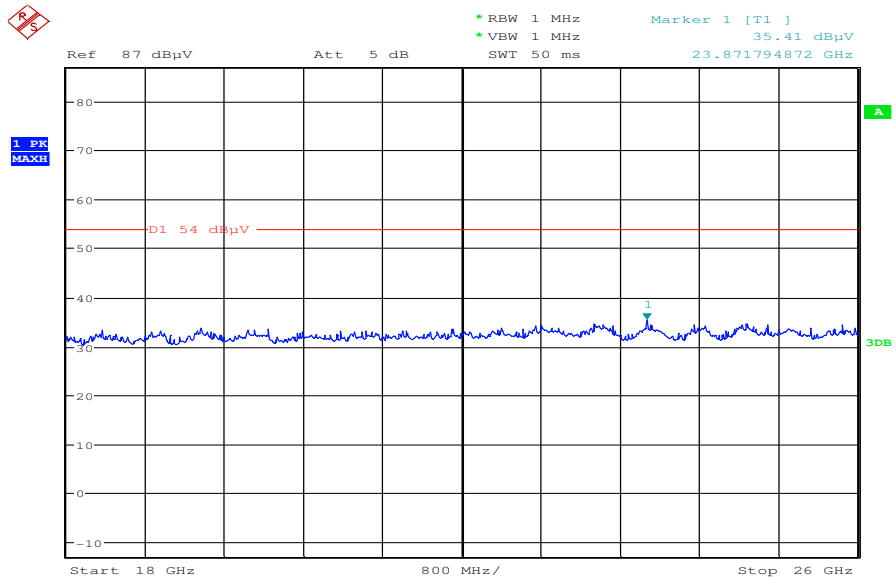
Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 24: 12 GHz to 18 GHz / channel 39 (horizontal/vertical), Pi/4-DQPSK



Date: 1.MAR.2011 17:44:23

Plot 25: 18 GHz to 26 GHz / channel 39 (horizontal/vertical), Pi/4-DQPSK



Date: 1.MAR.2011 17:38:12

Plot 26: 30 MHz to 1 GHz / channel 78 (vertical), Pi/4-DQPSK

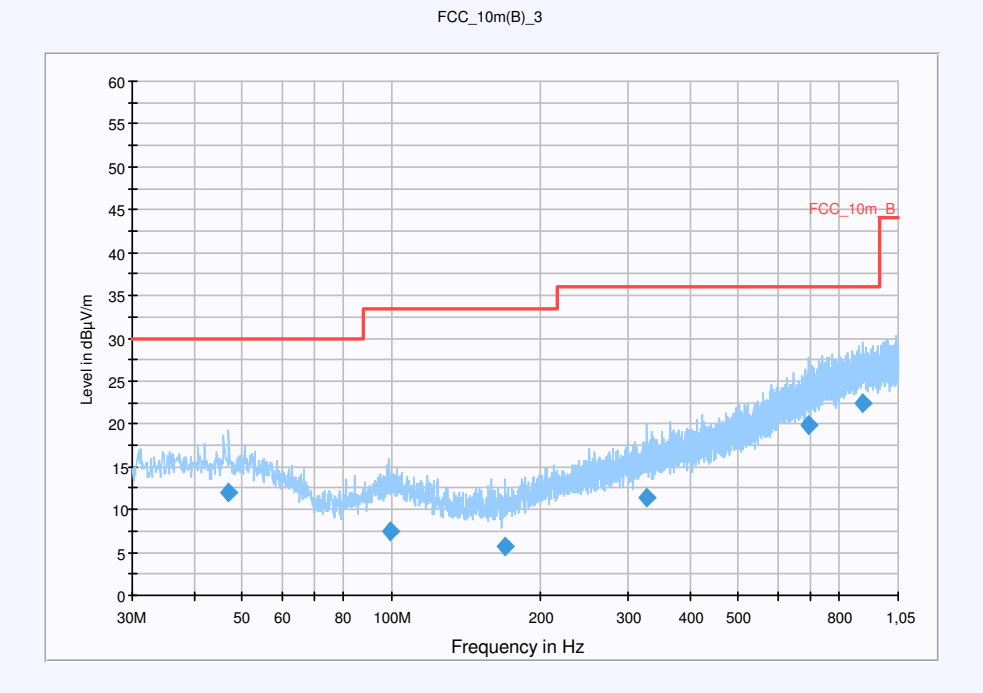
Common Information

EUT:	RDU71CW REV2
Serial Number:	FCC EMI Sample 24 IMEI: 004401.13.759445.9
Test Description:	FCC Part 15
Operating Conditions:	BT (pi/4 DQPSK) Ch.:78
Operator Name:	Wittenmeier
Comment:	AC 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

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

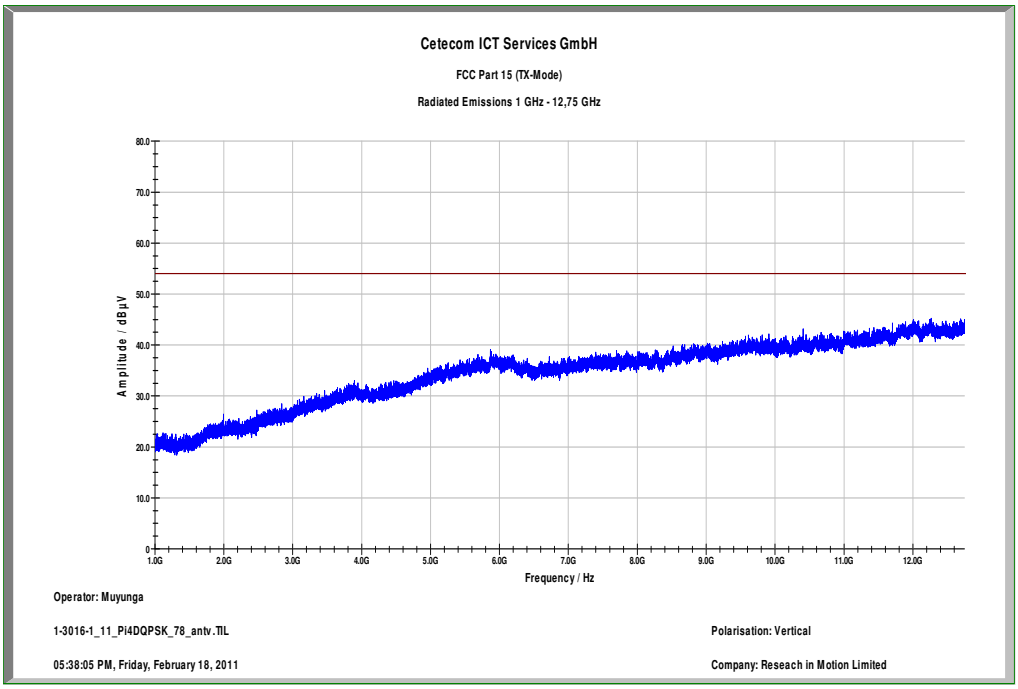
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



Final Result 1

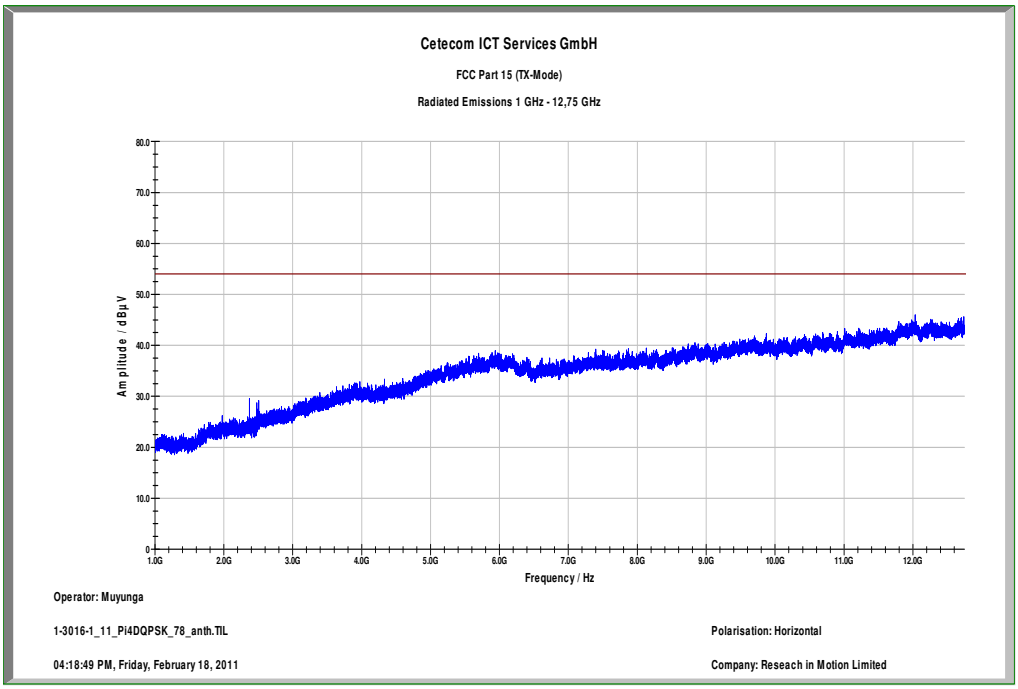
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
46.938750	12.0	15000.000	120.000	118.0	V	258.0	13.3	18.0	30.0
99.236100	7.5	15000.000	120.000	98.0	H	309.0	11.8	26.0	33.5
169.634850	5.6	15000.000	120.000	178.0	H	236.0	9.8	27.9	33.5
326.316450	11.4	15000.000	120.000	105.0	V	-1.0	15.4	24.6	36.0
695.806500	19.8	15000.000	120.000	149.0	V	48.0	22.4	16.2	36.0
888.280800	22.5	15000.000	120.000	220.0	H	219.0	25.1	13.5	36.0

Plot 27: 1 GHz to 12.75 GHz / channel 78 (vertical), Pi/4-DQPSK



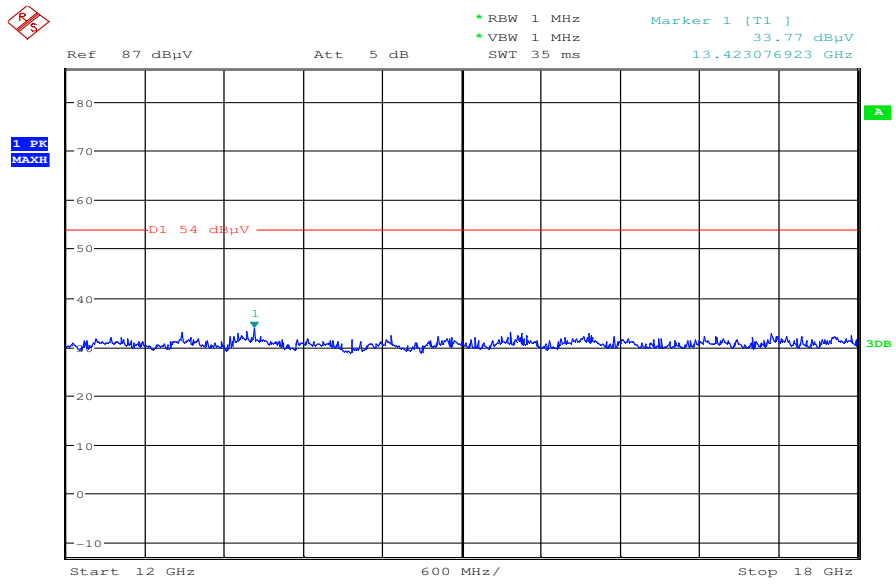
Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 28: 1 GHz to 12.75 GHz / channel 78 (horizontal), Pi/4-DQPSK



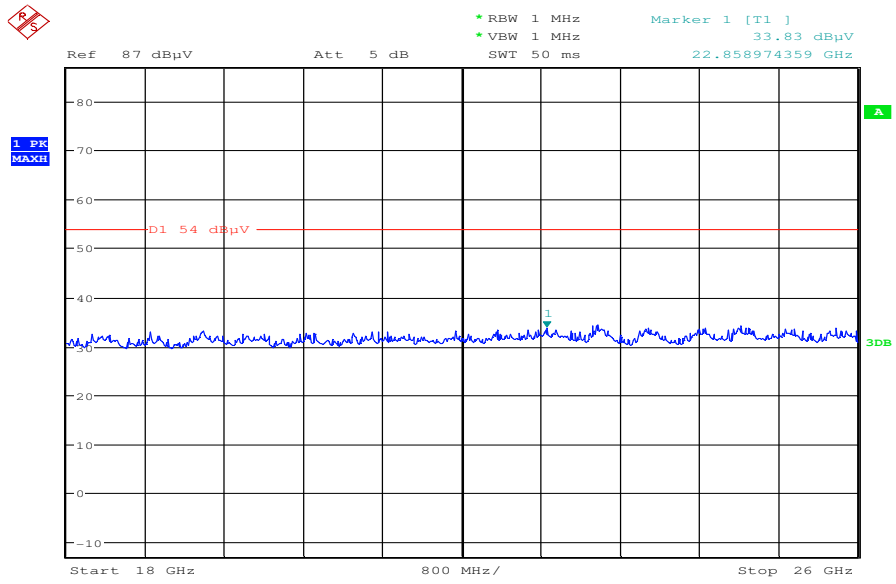
Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 29: 12 GHz to 18 GHz / channel 78 (horizontal/vertical), Pi/4-DQPSK



Date: 1.MAR.2011 17:44:38

Plot 30: 18 GHz to 26 GHz / channel 78 (horizontal/vertical), Pi/4-DQPSK



Date: 1.MAR.2011 17:38:35

Plot 31: 30 MHz to 1 GHz / channel 00 (vertical), 8DPSK

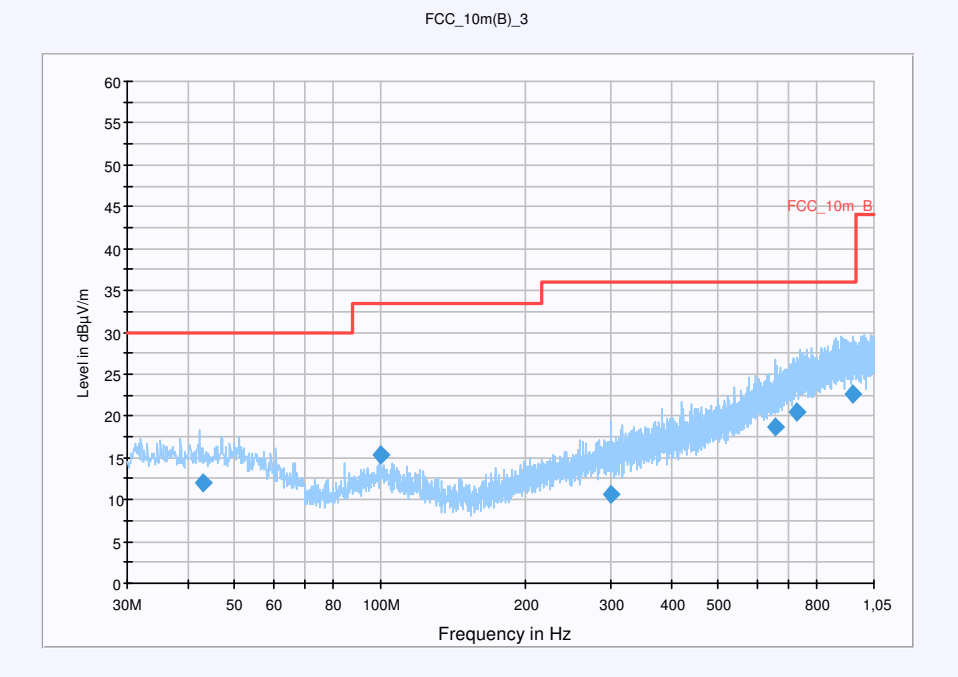
Common Information

EUT:	RDU71CW REV2
Serial Number:	FCC EMI Sample 24 IMEI:004401.13.759445.9
Test Description:	FCC Part 15
Operating Conditions:	BT (8DPSK) Ch.:0 +charging
Operator Name:	Wittenmeier
Comment:	AC 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

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

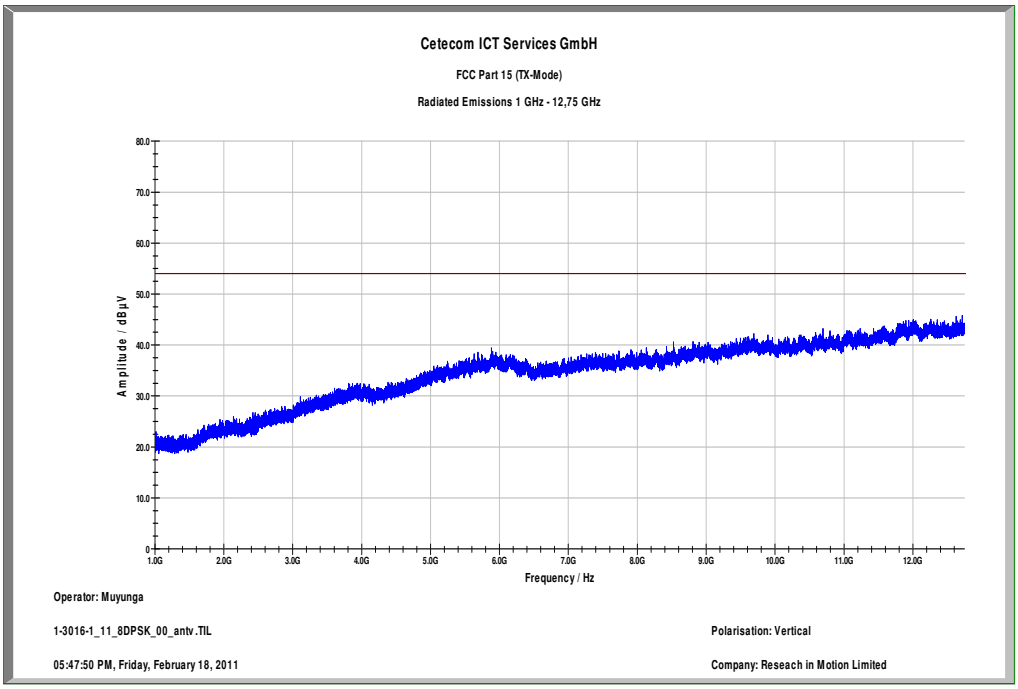
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



Final Result 1

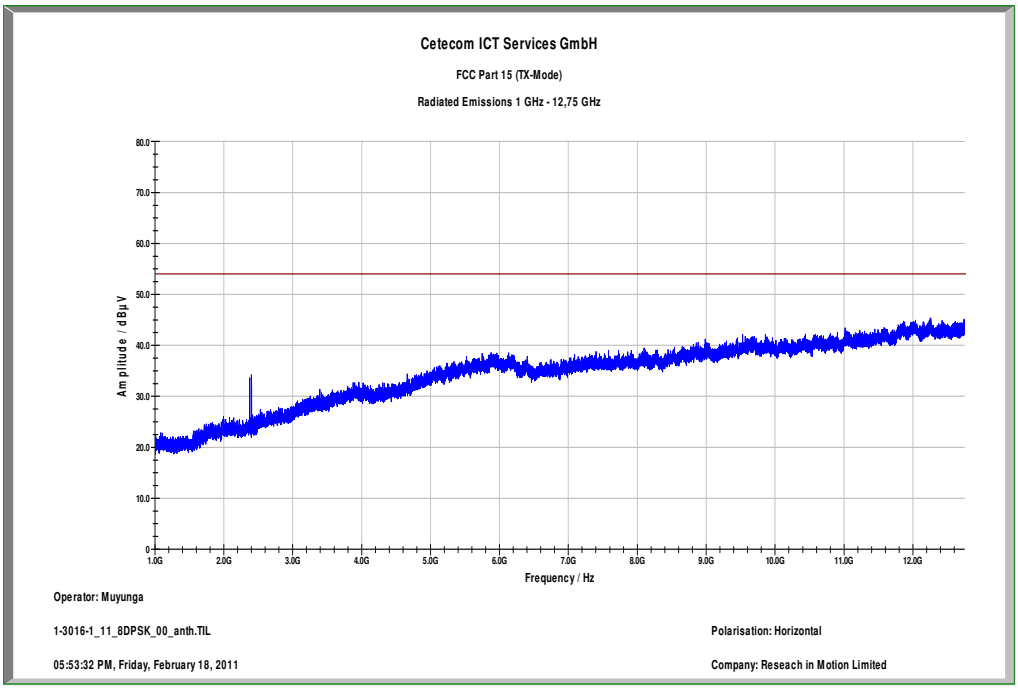
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
42.966900	11.9	15000.000	120.000	105.0	V	146.0	13.3	18.1	30.0
100.008750	15.3	15000.000	120.000	118.0	V	61.0	11.9	18.2	33.5
300.361200	10.7	15000.000	120.000	128.0	V	220.0	14.5	25.3	36.0
656.274450	18.8	15000.000	120.000	218.0	V	97.0	21.3	17.2	36.0
725.992800	20.5	15000.000	120.000	218.0	H	129.0	23.1	15.5	36.0
946.831500	22.6	15000.000	120.000	218.0	V	-5.0	25.3	13.4	36.0

Plot 32: 1 GHz to 12.75 GHz / channel 00 (vertical), 8DPSK



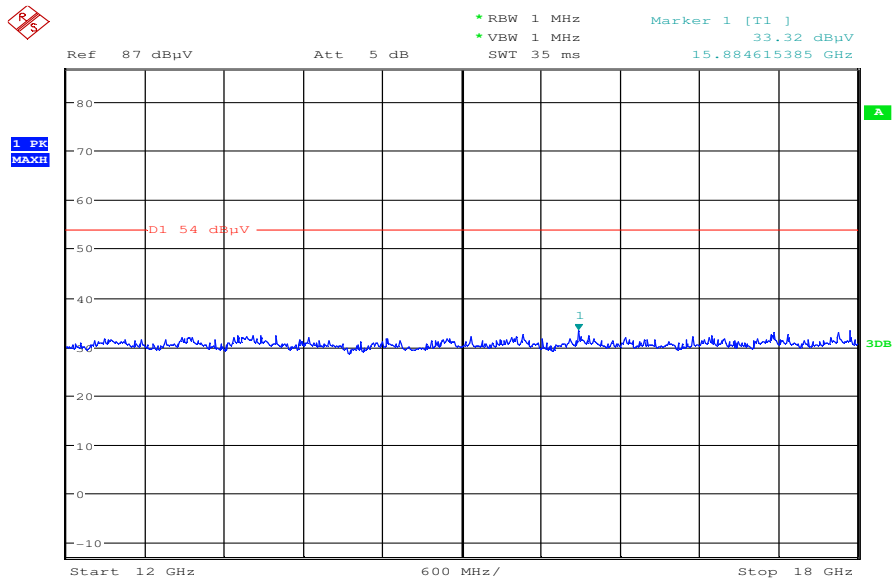
Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 33: 1 GHz to 12.75 GHz / channel 00 (horizontal), 8DPSK

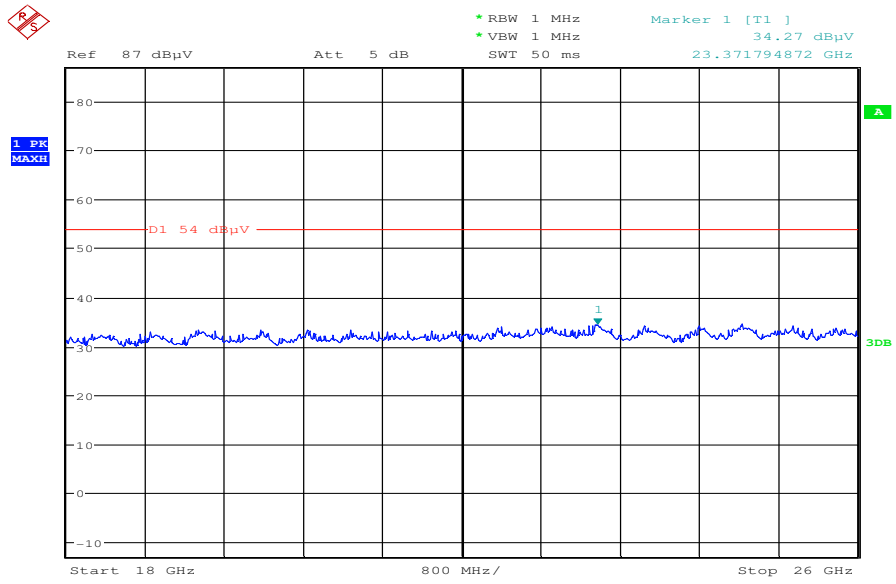


Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 34: 12 GHz to 18 GHz / channel 00 (horizontal/vertical), 8DPSK



Plot 35: 18 GHz to 26 GHz / channel 00 (horizontal/vertical), 8DPSK



Plot 36: 30 MHz to 1 GHz / channel 39 (vertical), 8DPSK

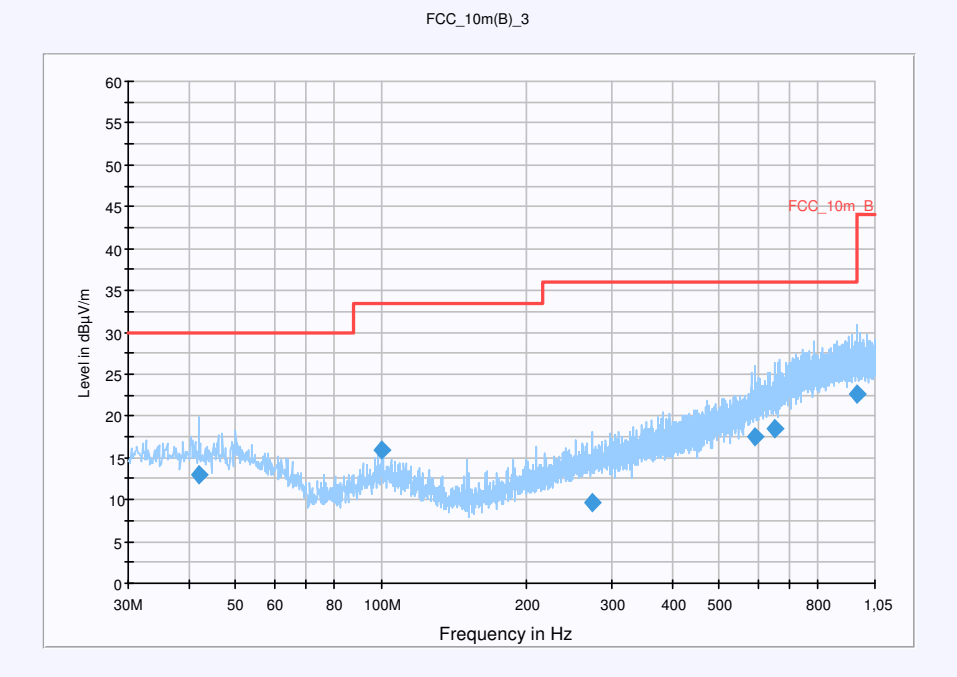
Common Information

EUT:	RDU71CW REV2
Serial Number:	FCC EMI Sample 24 IMEI:004404.13.759445.9
Test Description:	FCC Part 15
Operating Conditions:	BT (8DPSK) Ch.:39 +charging
Operator Name:	Wittenmeier
Comment:	AC 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

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

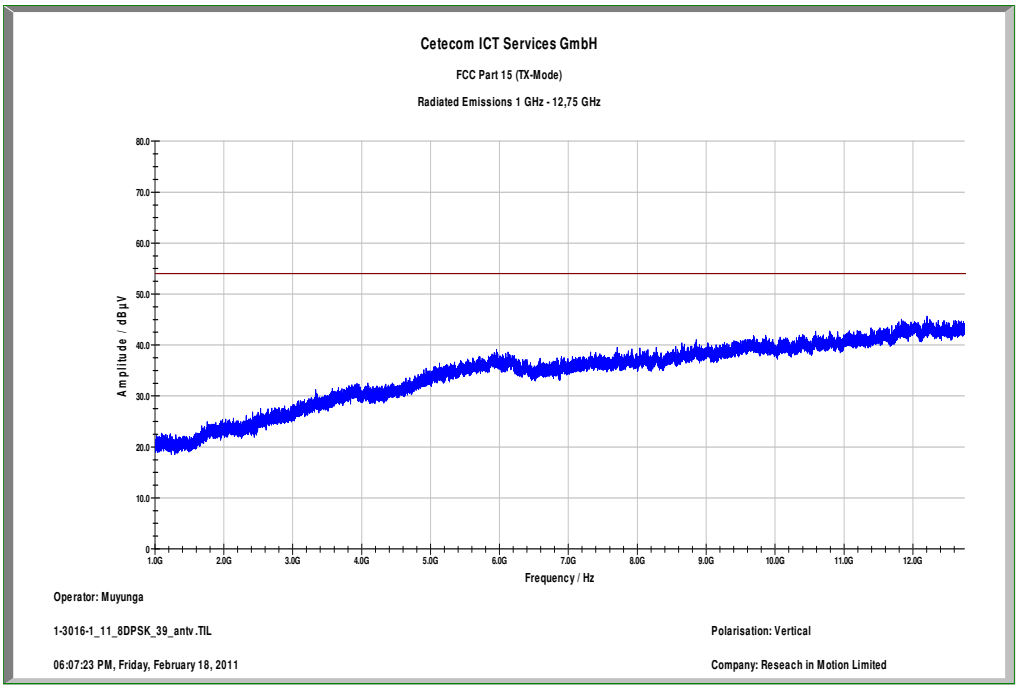
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



Final Result 1

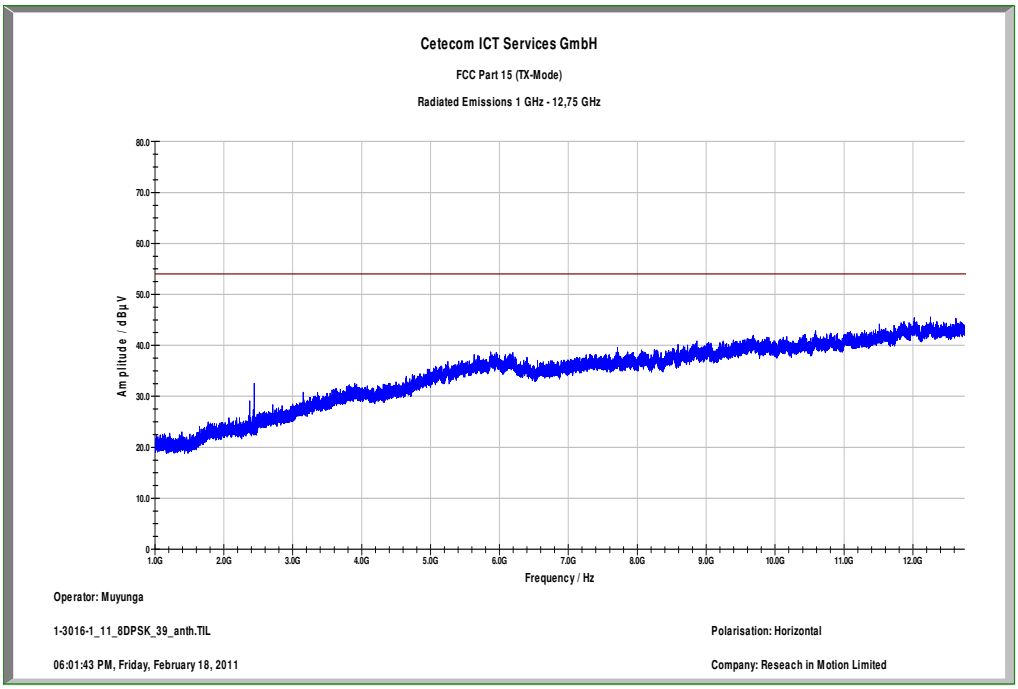
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
42.023250	13.1	15000.000	120.000	111.0	V	37.0	13.4	16.9	30.0
99.994800	15.9	15000.000	120.000	143.0	V	57.0	11.9	17.6	33.5
273.541950	9.7	15000.000	120.000	220.0	H	261.0	13.9	26.3	36.0
594.553200	17.5	15000.000	120.000	186.0	V	207.0	20.6	18.5	36.0
651.083550	18.5	15000.000	120.000	98.0	V	248.0	21.1	17.5	36.0
962.602050	22.7	15000.000	120.000	211.0	V	169.0	25.5	21.3	44.0

Plot 37: 1 GHz to 12.75 GHz / channel 39 (vertical), 8DPSK



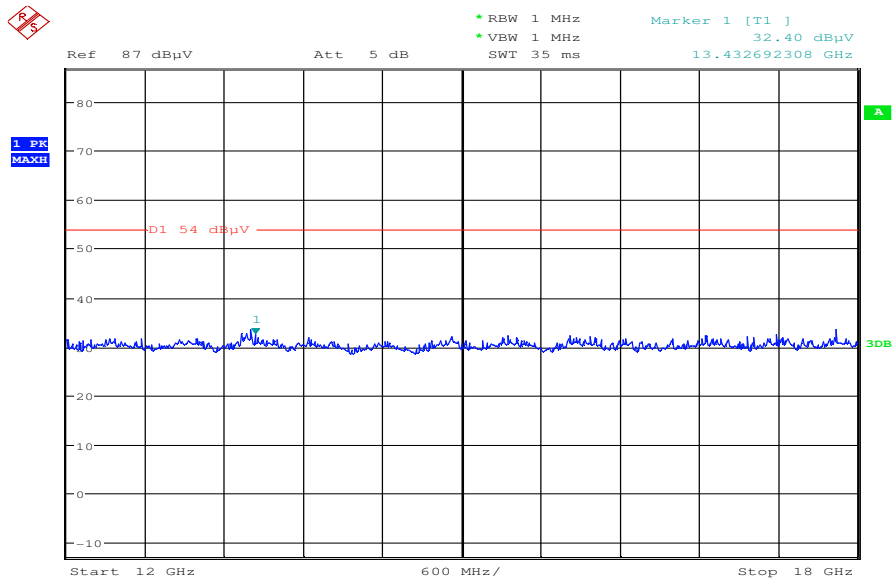
Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 38: 1 GHz to 12.75 GHz / channel 39 (horizontal), 8DPSK



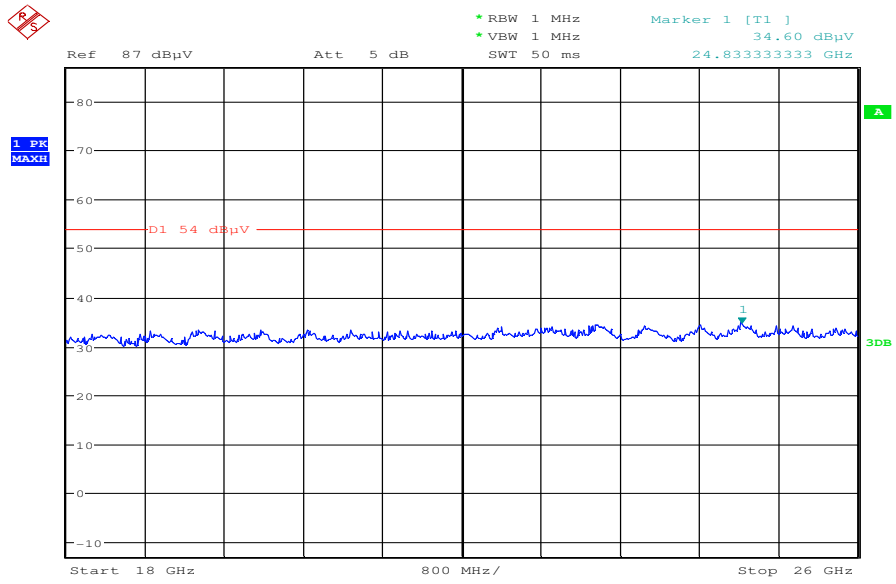
Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 39: 12 GHz to 18 GHz / channel 39 (horizontal/vertical), 8DPSK



Date: 1.MAR.2011 17:41:34

Plot 40: 18 GHz to 26 GHz / channel 39 (horizontal/vertical), 8DPSK



Date: 1.MAR.2011 17:39:31

Plot 41: 30 MHz to 1 GHz / channel 78 (vertical), 8DPSK

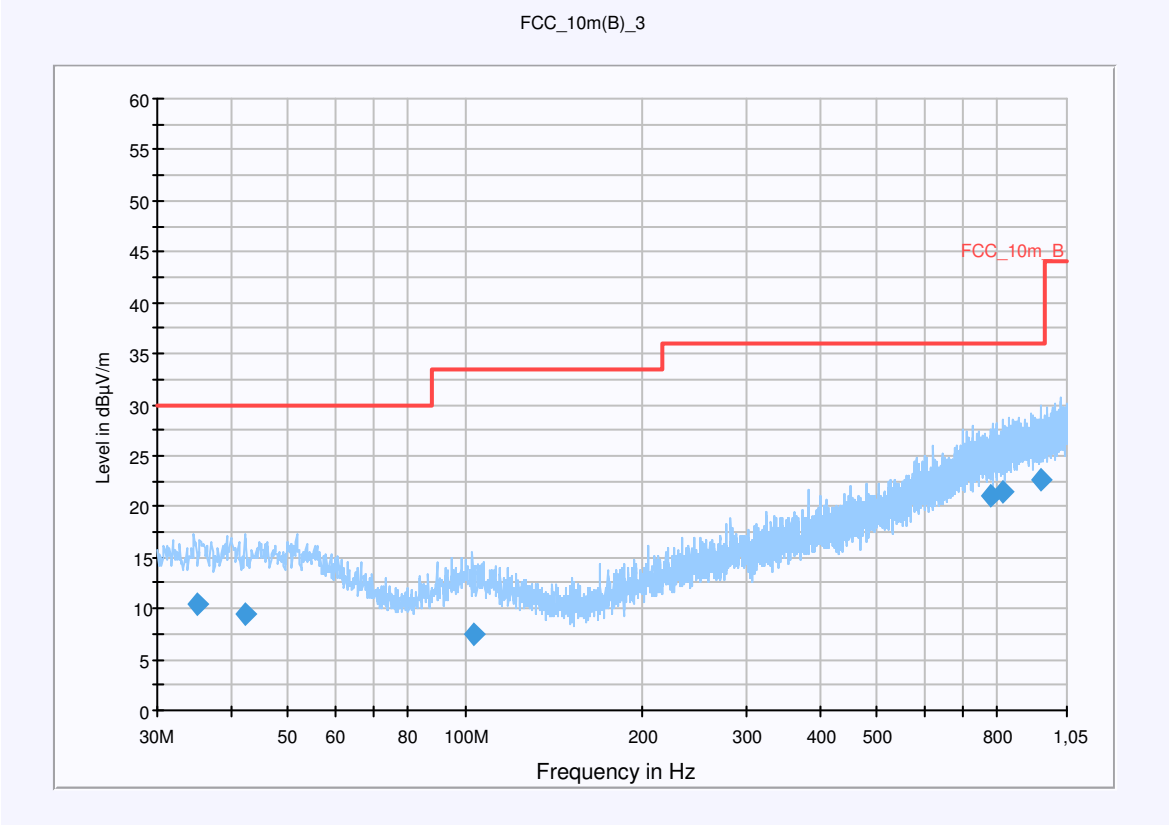
Common Information

EUT:	RDU71CW REV2
Serial Number:	FCC EMI Sample 24 IMEI:004404.13.759445.9
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	BT (8DPSK) Ch.: 78 + charging
Operator Name:	WIT
Comment:	AC: 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

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

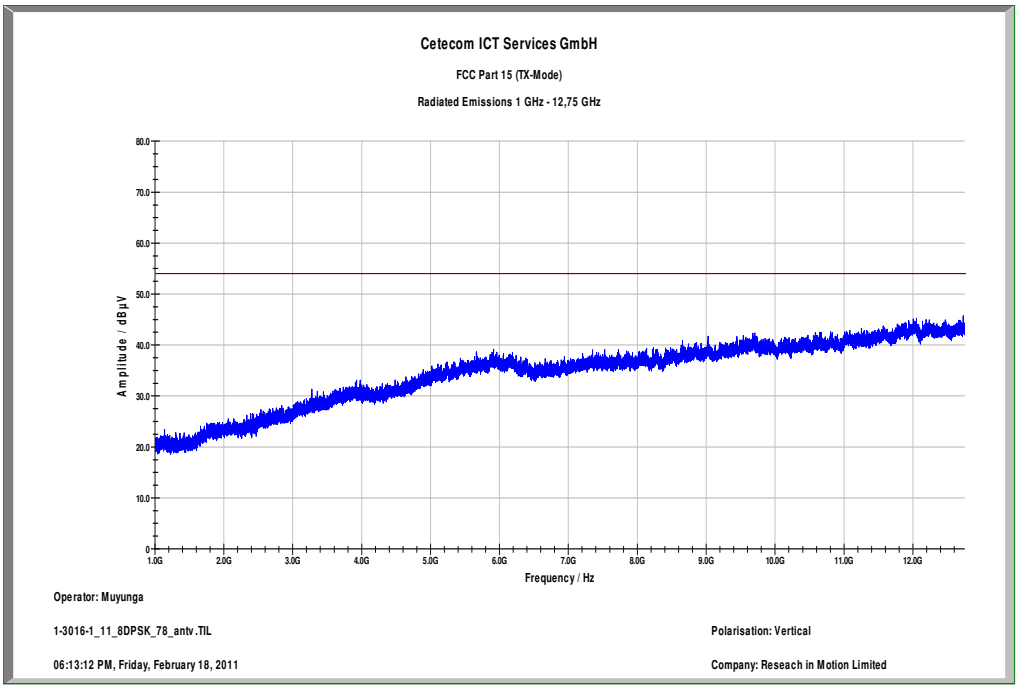
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 2 GHz	QuasiPeak	120 kHz	15 s	Receiver



Final Result 1

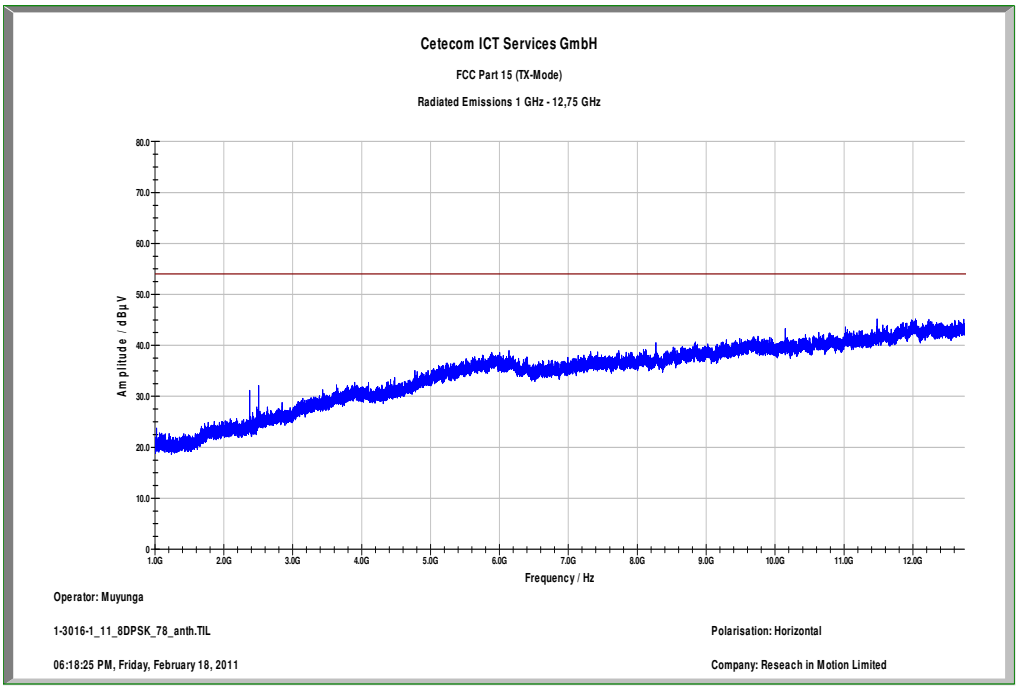
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.160750	10.3	15000.000	120.000	144.0	H	161.0	13.0	19.7	30.0	
42.299250	9.5	15000.000	120.000	207.0	H	-5.0	13.4	20.5	30.0	
103.360800	7.5	15000.000	120.000	177.0	V	236.0	11.6	26.0	33.5	
782.724750	21.1	15000.000	120.000	98.0	H	258.0	23.7	14.9	36.0	
818.639550	21.5	15000.000	120.000	212.0	H	146.0	24.1	14.5	36.0	
949.566750	22.6	15000.000	120.000	98.0	H	74.0	25.4	13.4	36.0	

Plot 42: 1 GHz to 12.75 GHz / channel 78 (vertical), 8DPSK



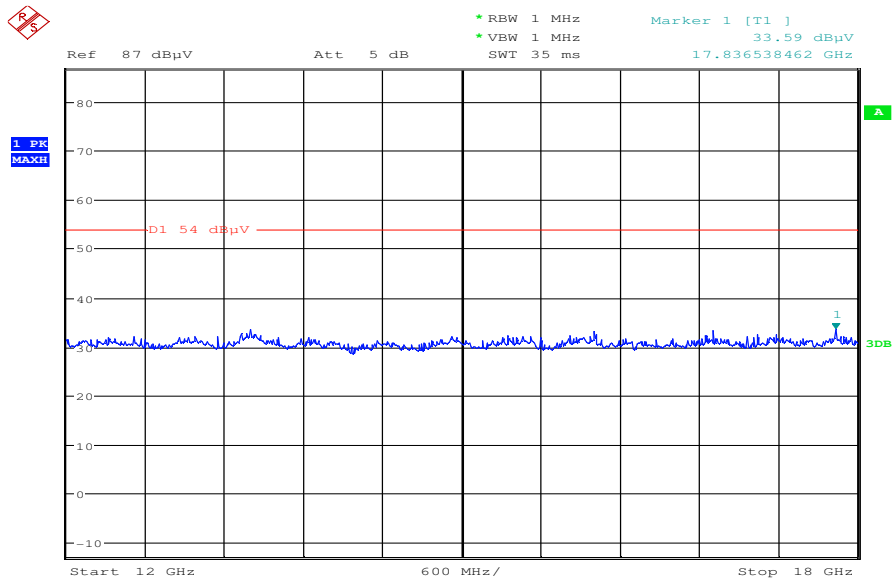
Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 43: 1 GHz to 12.75 GHz / channel 78 (horizontal), 8DPSK

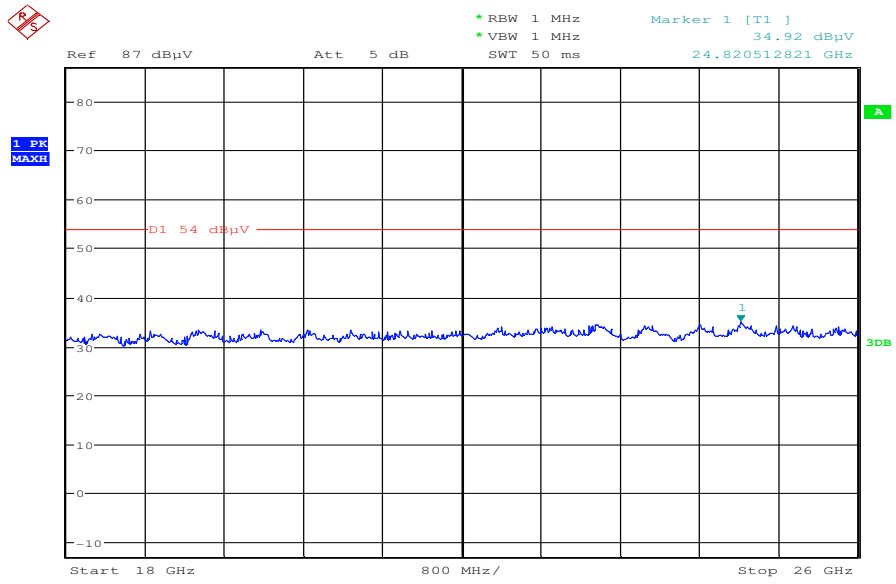


Carrier suppressed with a 2.4 GHz-band rejection filter.

Plot 44: 12 GHz to 18 GHz / channel 78 (horizontal/vertical), 8DPSK



Plot 45: 18 GHz to 26 GHz / channel 78 (horizontal/vertical), 8DPSK



9.3 TX spurious emissions radiated < 30 MHz

Description:

Measurement of the radiated spurious emissions in transmit mode below 30 MHz. The EUT is set to single channel mode and the transmit channel is channel 39. This measurement is representative for all channels and modes. If critical peaks are found channel 00 and channel 78 will be measured too. The measurement is performed in the mode with the highest output power. The limits are recalculated to a measurement distance of 3 m with 40 dB/decade according CFR Part 2.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi peak
Sweep time:	Auto
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold

Limits:

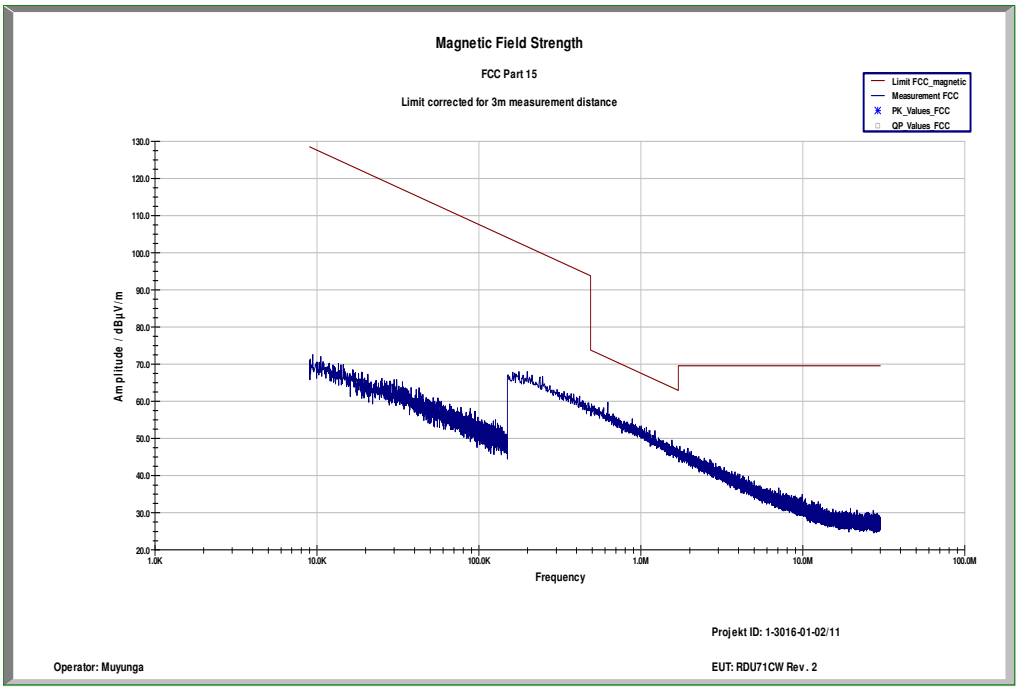
FCC		IC
CFR Part 15.209(a)		-/-
TX spurious emissions radiated < 30 MHz		
Frequency (MHz)	Field strength (dBµV/m)	Measurement distance
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

Result:

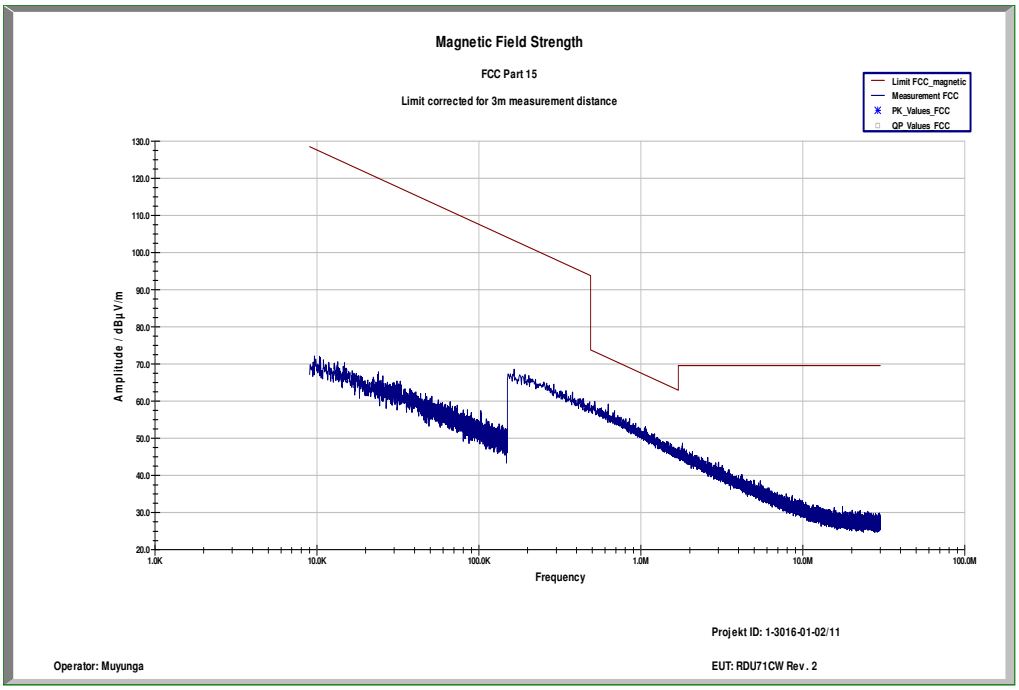
TX spurious emissions radiated < 30 MHz [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
No critical peaks found		
Measurement uncertainty	± 3 dB	

Result: **The result of the measurement is passed.**

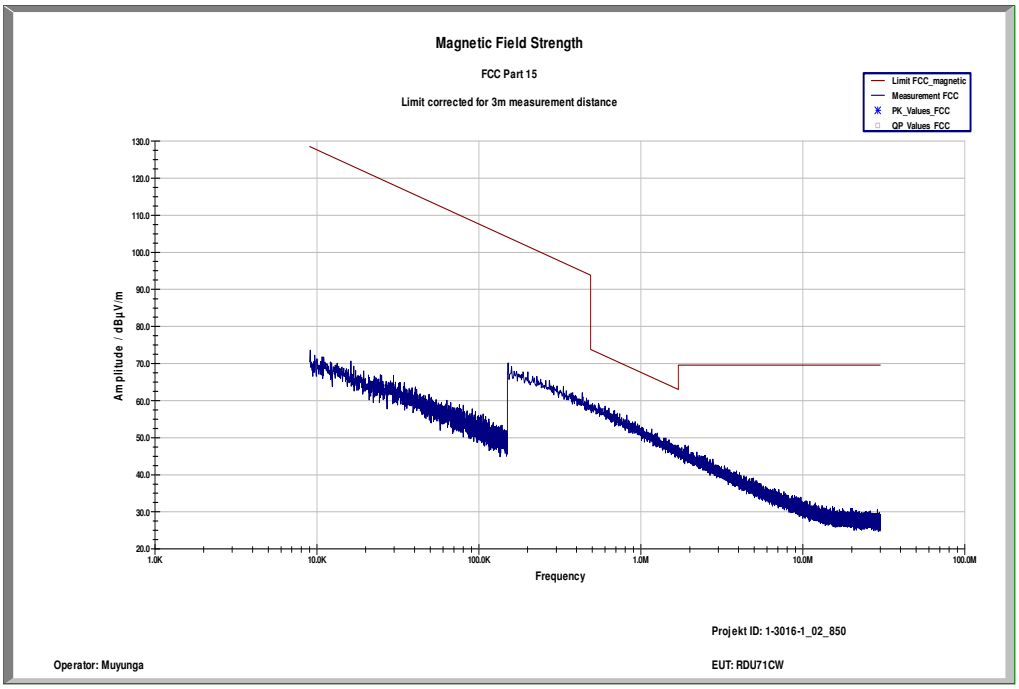
Plot 1: 9 kHz to 30 MHz / channel 39 (valid for all channels and modes), GFSK modulation



Plot 2: 9 kHz to 30 MHz / channel 39 (valid for all channels and modes), Pi/4 DQPSK modulation



Plot 3: 9 kHz to 30 MHz / channel 39 (valid for all channels and modes), 8 DPSK modulation



10 Test equipment and ancillaries used for tests

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).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Labor/Item).

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	n. a.	Isolating Transformer	RT5A	Grundig	8041	300001626	g		
2	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	08.01.2009	08.01.2012
3	n. a.	Coaxial Attenuator 30dB/500W	8325	Bird	1530	300001595	ev		
4	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vlKl!	05.03.2009	05.09.2011
5	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
6	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996		23.03.2009	
7	Spec.A. 2_2e	System rack for EMI measurement solution	85900	HP I.V.	*	300000222	ne		
8	9	Artificial Mains 9 kHz to 30 MHz	ESH3-Z5	R&S	828576/020	300001210	Ve	06.01.2010	06.01.2012
9	n. a.	Relais Matrix	3488A	HP Meßtechnik	2719A15013	300001156	ne		
10	n. a.	Relais Matrix	PSU	R&S	890167/024	300001168	ne		
11	n. a.	Isolating Transformer	RT5A	Grundig	9242	300001263	ne		
12	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
13	n. a.	Switch / Control Unit	3488A	HP	2605e08770	300001443	ne		
14	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
15	n. a.	Band Reject filter	WRCG1855/1910-1835/1925-40/8SS	Wainwright	7	300003350	ev		
16	n. a.	Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
17	n. a.	TILE-Software Emission	Quantum Change, Modell TILE-ICS/FULL	EMCO	none	300003451	ne		
18	n. a.	Highpass Filter	WHKX2.9/18G-12SS	Wainwright	1	300003492	ev		
19	n. a.	Highpass Filter	WHK1.1/15G-10SS	Wainwright	3	300003255	ev		
20	n. a.	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne		
21	n. a.	PSA Spectrum Analyzer 3 Hz - 26.5 GHz	E4440A	Agilent Technologies	MY48250080	300003812	k	08.09.2010	08.09.2012
22	n. a.	MXG Microwave Analog Signal Generator	N5183A	Agilent Technologies	MY47420220	300003813	k	13.09.2010	13.09.2012
23	n. a.	RF Filter Section 9kHz - 1GHz	N9039A	Agilent Technologies	MY48260003	300003825	vlKl!	08.09.2010	08.09.2012

24	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vlKl!	17.12.2008	17.12.2011

Agenda: Kind of Calibration

k	calibration / calibrated	EK	limited calibration
ne	not required (k, ev, izw, zw not required)	zw	cyclical maintenance (external cyclical maintenance)
ev	periodic self verification	izw	internal cyclical maintenance
Ve	long-term stability recognized	g	blocked for accredited testing
vlkI!	Attention: extended calibration interval		
NK!	Attention: not calibrated	*)	next calibration ordered / currently in progress

Annex A Document history

Version	Applied changes	Date of release
1.0	Initial release	2011-04-29
-A	General EUT information	2011-05-20

Annex B Further information

Glossary

DUT	-	Device under Test
EMC	-	Electromagnetic Compatibility
EUT	-	Equipment under Test
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	not applicable
S/N	-	Serial Number
SW	-	Software