

## TEST REPORT

Test report no.: 1-5579/12-01-23-E



### Testing laboratory

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#### Accredited Testing Laboratory:

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS). The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01  
Area of Testing: Radio/Satellite Communications

### Applicant

**Research In Motion Limited**  
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Waterloo, ON N2L 3W8 / CANADA  
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### Manufacturer

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

### Test standard/s

47 CFR Part 15 Title 47 of the Code of Federal Regulations; Chapter I  
Part 15 - Radio frequency devices

RSS - 210 Issue 8 Spectrum Management and Telecommunications - Radio Standards Specification  
Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands):  
Category I Equipment

For further applied test standards please refer to section 3 of this test report.

### Test Item

**Kind of test item:** Blackberry GSM Phones  
**Model name:** RFN81UW  
**FCC ID:** L6ARFN80UW  
**IC:** 2503A-RFN80UW  
**Frequency:** ISM band 5725 MHz to 5850 MHz  
(lowest channel 149 – 5745 MHz, highest channel 165 – 5825 MHz)  
**Technology tested:** WLAN (OFDM)  
**Antenna:** Integrated antenna  
**Power Supply:** 3.8 V DC by Li - Ion battery  
**Temperature Range:** No range needed!

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 report authorised:

p.o.

Andreas Luckenbill  
Expert

### Test performed:

p.o.

Stefan Bös  
Senior Testing Manager

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## 2 General information

### 2.1 Notes and disclaimer

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 generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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This test report is electronically signed and valid without handwritten 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:	2012-11-30
Date of receipt of test item:	2012-12-03
Start of test:	2012-12-03
End of test:	2013-01-09
Person(s) present during the test:	-/-

## 3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15	2010-10	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices
RSS - 210 Issue 8	2010-12	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

### 3.1 Measurement guidance

DTS : KDB 558074	2012-04	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247
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#### 4 Test environment

Temperature:	$T_{nom}$	+22 °C during room temperature tests
	$T_{max}$	-/- °C during high temperature tests
	$T_{min}$	-/- °C during low temperature tests
Relative humidity content:		42 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	$V_{nom}$	3.8 V DC by Li - Ion battery
	$V_{max}$	-/- V
	$V_{min}$	-/- V

#### 5 Test item

Kind of test item	:	Blackberry GSM Phones
Type identification	:	RFN81UW
S/N serial number	:	IMEI 004401139252155 / 004401139334680
HW hardware status	:	CER-53015-001-Rev 2-905 - 01 / CER-53015-001-Rev 3-905-01
SW software status	:	127.0.1.3123 / 127.0.1.3901
Frequency band [MHz]	:	ISM band 5725 MHz to 5850 MHz (lowest channel 149 – 5745 MHz, highest channel 165 – 5825 MHz)
Type of radio transmission	:	OFDM
Use of frequency spectrum	:	
Type of modulation	:	QPSK, 16 – QAM, 64 – QAM
Number of channels	:	a & n HT20 – mode: 5 n HT40 – mode: 2
Antenna	:	Integrated antenna
Power supply	:	3.8 V DC by Li - Ion battery
Temperature range	:	Not needed!

#### 5.1 Additional information

Test setup- and EUT-photos are included in test reports: 1-5579/12-01-01\_AnnexA  
1-5579/12-01-01\_AnnexD

#### 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 RSS 210, Issue 8	Passed	2013-03-28	Tests according to manufacturer test plan!

Test specification clause	Test case	Temperature conditions	Power source voltages	Mode	Pass	Fail	NA	NP	Remark
§15.247(b)(4) RSS 210 / A8.4(2)	Antenna gain	Nominal	Nominal	OFDM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
§15.247(e) RSS 210 / A8.2(b)	Power spectral density	Nominal	Nominal	OFDM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
§15.247(a)(2) RSS 210 / A8.2(a)	Spectrum bandwidth - 6dB bandwidth	Nominal	Nominal	OFDM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
§15.247(a)(2) RSS 210 / A8.2(a)	Spectrum bandwidth - 20dB bandwidth	Nominal	Nominal	OFDM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
§15.247(b)(3) RSS-210 / A8.4(4)	Maximum output power	Nominal	Nominal	OFDM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
§15.247(d) RSS-210 / A8.5	Band edge compliance conducted	Nominal	Nominal	OFDM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
§15.205 RSS-210 / A8.5	Band edge compliance radiated	Nominal	Nominal	OFDM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
§15.247(d) RSS-210 / A8.5	TX spurious emissions conducted	Nominal	Nominal	OFDM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
§15.247(d) RSS-210 / A8.5	TX spurious emissions radiated	Nominal	Nominal	OFDM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Passed
§15.109 RSS-Gen	RX spurious emissions radiated	Nominal	Nominal	-/-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
§15.209(a) RSS-Gen	TX spurious emissions radiated < 30 MHz	Nominal	Nominal	OFDM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
§15.107(a)	Conducted emissions < 30 MHz	Nominal	Nominal	OFDM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-

**Note:** NA = Not Applicable; NP = Not Performed

## 8 RF measurements

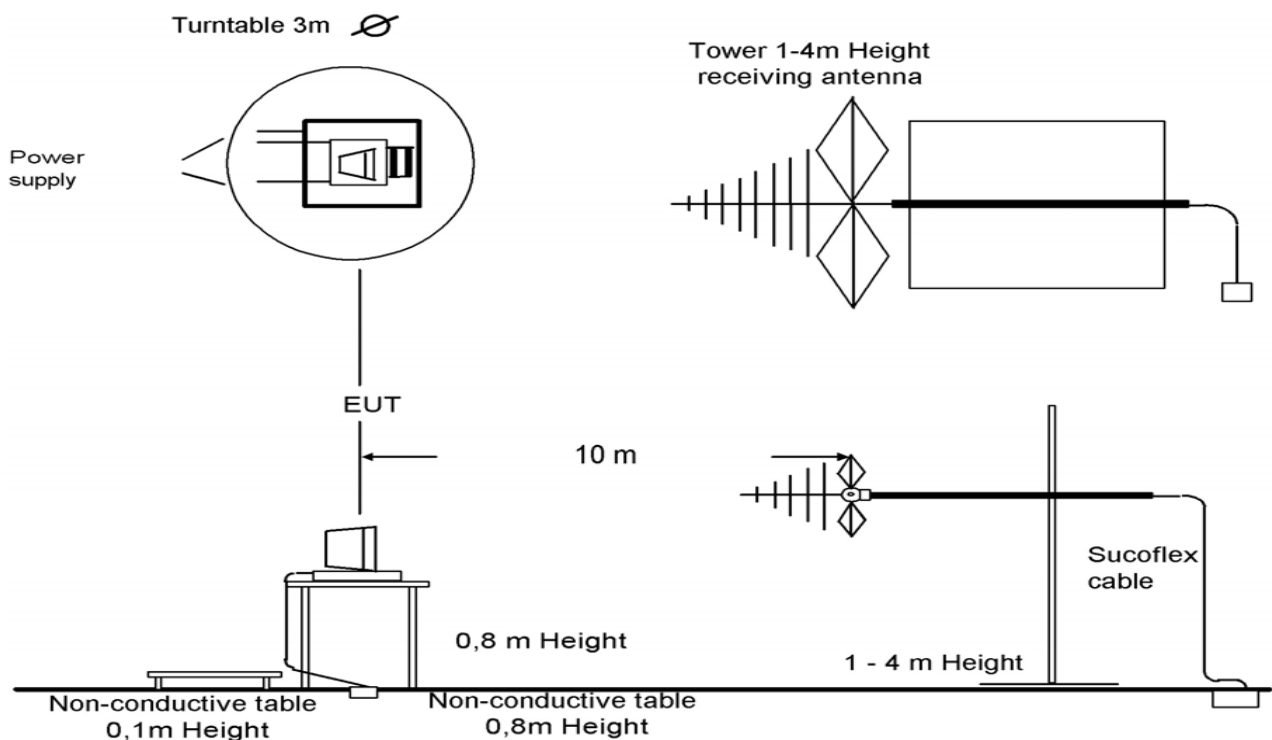
### 8.1 Description of test setup

#### 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



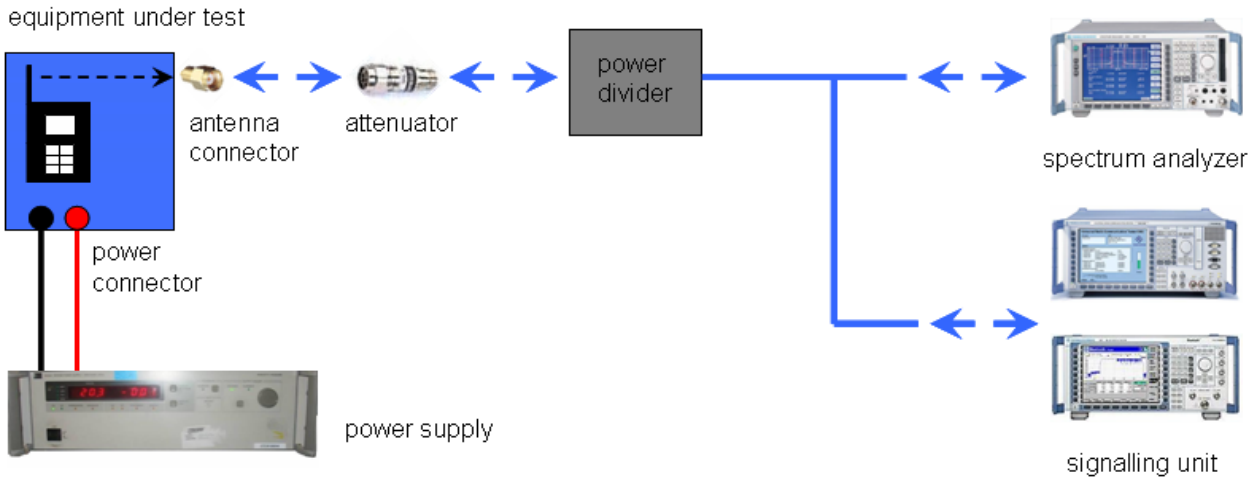
Picture 1: Diagram radiated measurements

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

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

Reference documents: None

Special test descriptions: None

Configuration descriptions: None

- Test mode:
- No test mode available.  
lperf was used to ping another device with the largest support packet size
  - Special software is used.  
EUT is transmitting pseudo random data by itself

## 9 Measurement results

### 9.1 Output power verification (conducted)

Not performed!

### 9.2 Antenna gain

Not performed!

### 9.3 Maximum output power

Not performed!

### 9.4 Power spectral density

Not performed!

### 9.5 Spectrum bandwidth – 6 dB

Not performed!

### 9.6 Spectrum bandwidth – 20 dB

Not performed!

### 9.7 Band edge compliance conducted

Not applicable! No restricted band close to used band!

### 9.8 Band edge compliance radiated

Not applicable! No restricted band close to used band!



## 9.9 Band edge radiated acc. part 15.247 band limits

### Description:

Measurement of the radiated band edge compliance according the band limits of part 15.407. The EUT is turned in the position that results in the maximum level at the band edge. Then a sweep over the corresponding band edge is performed. The EUT is set to channel 1 for the lower band edge and to channel 11 for the upper band edge. Measurement distance is 3m.

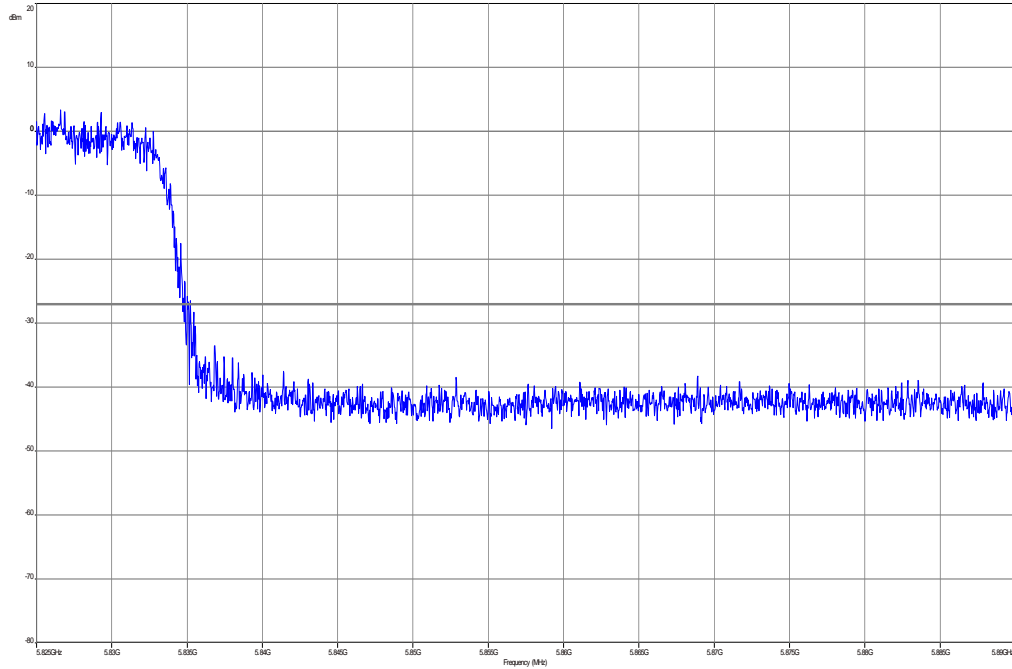
### Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 MHz / 1 MHz
Video bandwidth:	1 MHz / 1 M Hz
Span:	See plot!
Trace-Mode:	Max Hold

### Limits:

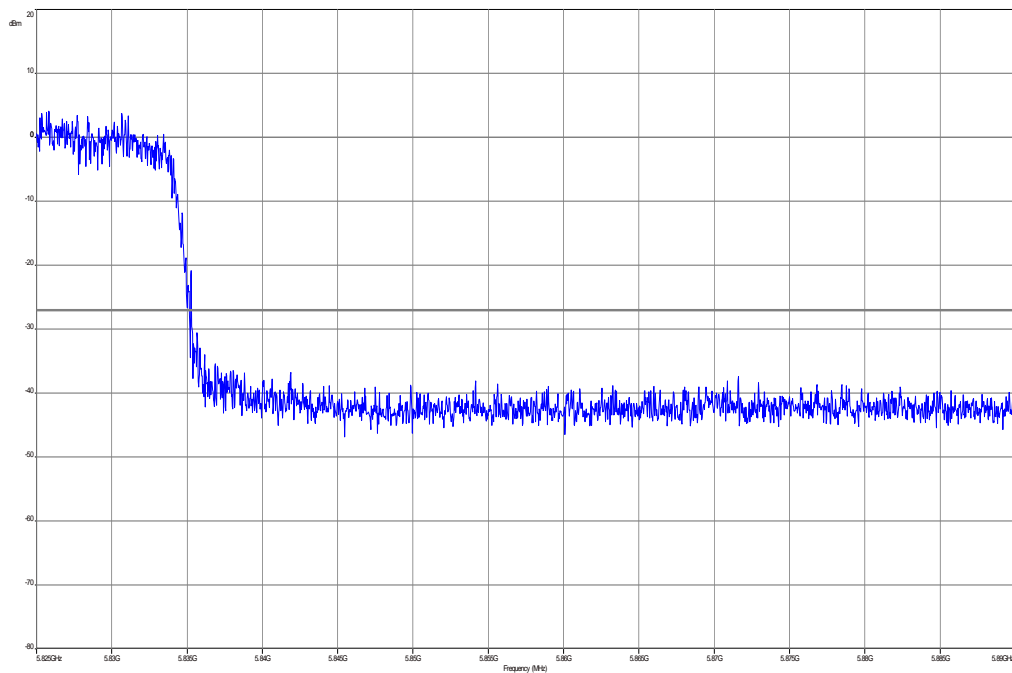
FCC Part 15.247 (d)	IC
Band Edge Radiated	
<p>(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted the highest level of the desired power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 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)).</p>	

**Plot 1: Channel 165, a- mode (6 Mbps)**



Limit reached with 20 dBc at 5850 MHz

**Plot 2: Channel 165, n- mode (MCS 0)**



Limit reached with 20 dBc at 5850 MHz

**Result: Not rated**

## 9.10 TX spurious emissions conducted

Not performed!

### 9.11 TX spurious emissions radiated

**Description:**

Measurement of the radiated spurious emissions in transmit mode. The measurement is performed at channel 149, 157 and 165. The measurement is repeated for all modulations.

**Measurement:**

Measurement parameter	
Detector:	Peak / Quasi Peak / RMS
Sweep time:	Auto
Resolution bandwidth:	F > 1 GHz: 1 MHz F < 1 GHz: 100 kHz
Video bandwidth:	Sweep: 100 kHz Remeasurement: 10 Hz / 3 MHz
Span:	30 MHz to 40 GHz
Trace-Mode:	Max Hold
Measured Modulation	<input checked="" type="checkbox"/> OFDM a – mode <input checked="" type="checkbox"/> OFDM n – mode HT20 <input type="checkbox"/> OFDM n – mode HT40

The modulation with the highest output power was used to perform the transmitter spurious emissions. If spurious were detected a re-measurement was performed on the detected frequency with each modulation.

**Limits:**

FCC	IC	
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)).		
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

**Results: OFDM / a – mode**

TX Spurious Emissions Radiated [dBµV/m]								
OFDM / a – mode								
Channel 149			Channel 157			Channel 165		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
No critical emissions between 1 GHz and 12.75 GHz. All detected emissions are more than 10 dB below the limit.			No critical emissions between 1 GHz and 12.75 GHz. All detected emissions are more than 10 dB below the limit.			No critical emissions between 1 GHz and 12.75 GHz. All detected emissions are more than 10 dB below the limit.		
For emissions above 12.75 GHz, please take a look at the plots.			For emissions above 12.75 GHz, please take a look at the plots.			For emissions above 12.75 GHz, please take a look at the plots.		
Measurement uncertainty			± 3 dB					

**Result: Passed**

**Results: OFDM / n – mode**

TX Spurious Emissions Radiated [dBµV/m]								
OFDM / n – mode								
Channel 149			Channel 157			Channel 165		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
No critical emissions between 1 GHz and 12.75 GHz. All detected emissions are more than 10 dB below the limit.			No critical emissions between 1 GHz and 12.75 GHz. All detected emissions are more than 10 dB below the limit.			No critical emissions between 1 GHz and 12.75 GHz. All detected emissions are more than 10 dB below the limit.		
For emissions above 12.75 GHz, please take a look at the plots.			For emissions above 12.75 GHz, please take a look at the plots.			For emissions above 12.75 GHz, please take a look at the plots.		
Measurement uncertainty			± 3 dB					

**Result: Passed**

**Plots: OFDM / a – mode**

**Plot 1:** Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

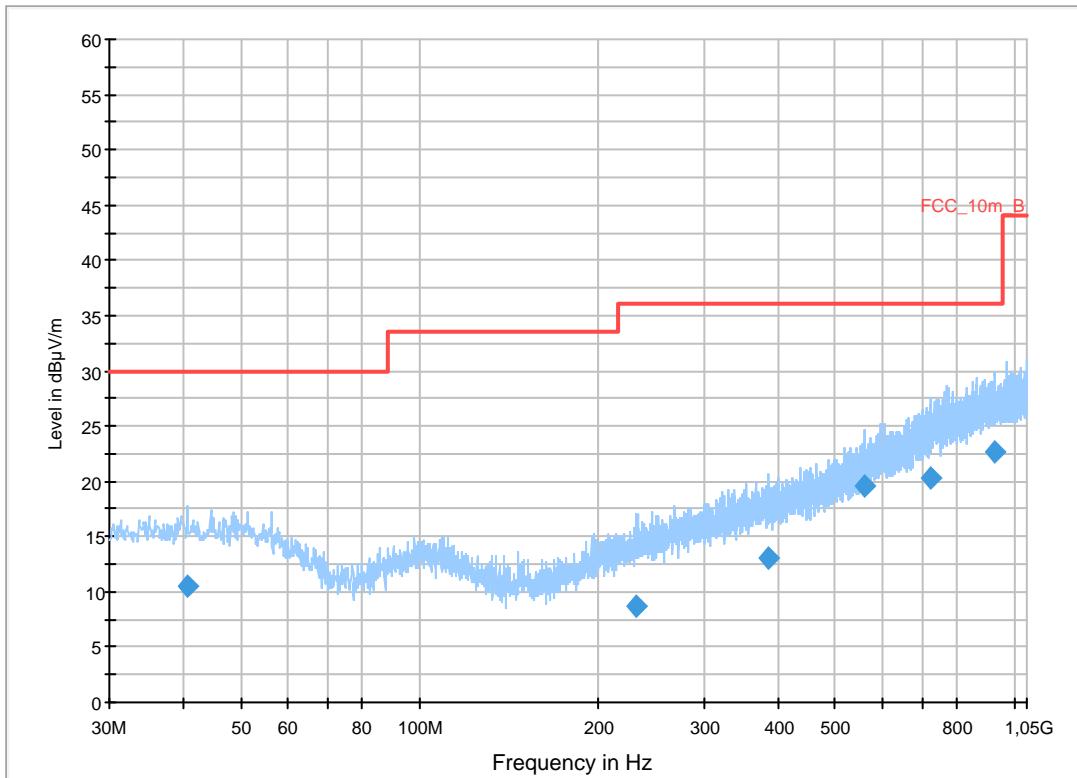
**Common Information**

EUT: RFN81UW  
 Test Description: FCC part 15 B class B @ 10 m  
 Operating Conditions: 802.11A TX CH149 6MpS  
 Operator Name: Medrow  
 Comment: battery powered

**Scan Setup: STAN\_Fin [EMI radiated]**

Hardware Setup: Electric Field (NOS)  
 Receiver: [ESCI 3]  
 Level Unit: dBµV/m

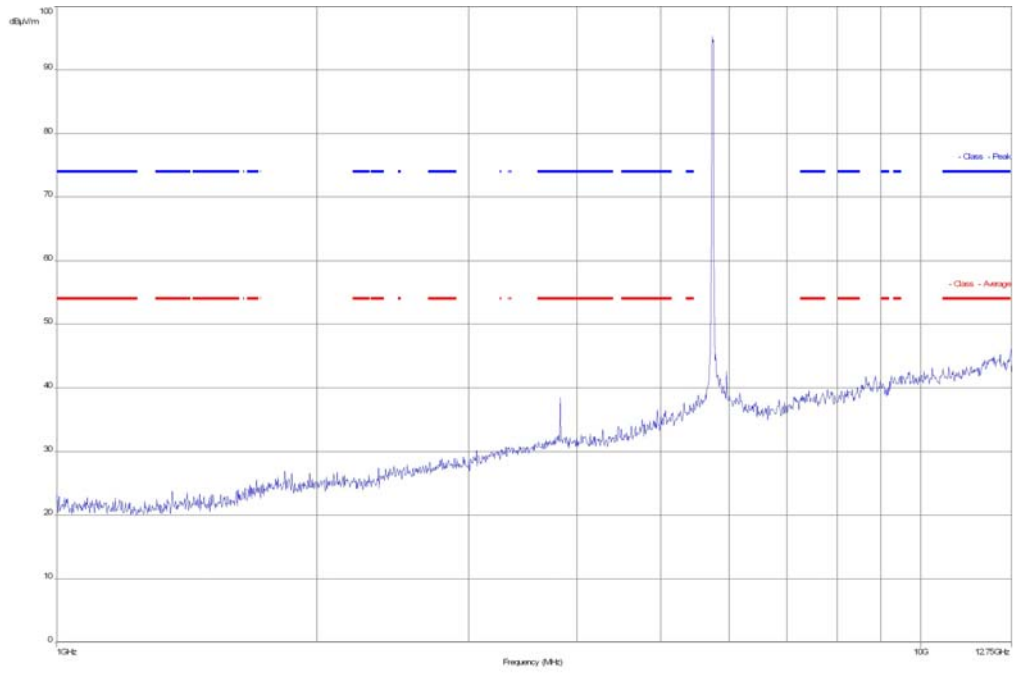
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK FCC_10m(B)_3	120 kHz	1 s	20 dB



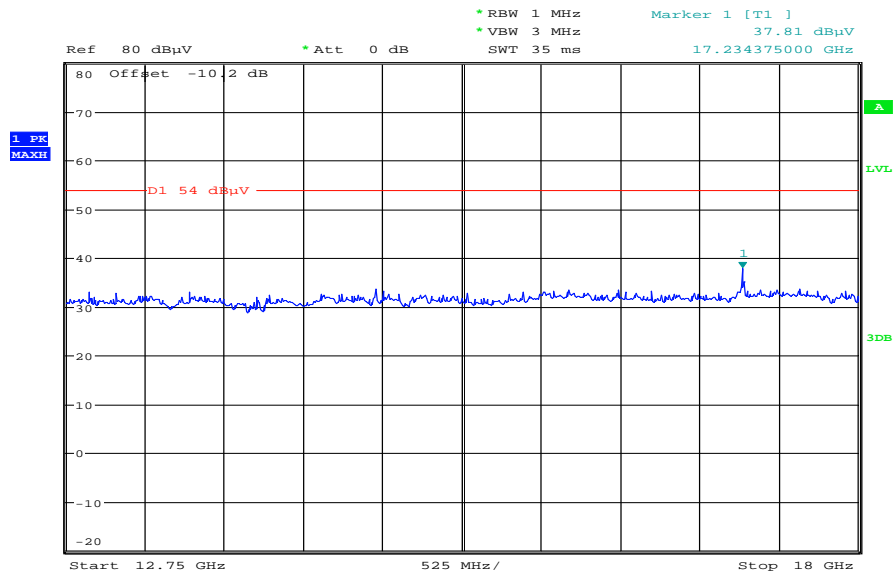
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
40.618050	10.5	1000.0	120.000	162.0	V	268.0	13.4	19.5	30.0	
230.978700	8.7	1000.0	120.000	170.0	H	10.0	12.7	27.3	36.0	
386.815500	13.1	1000.0	120.000	170.0	V	0.0	16.7	22.9	36.0	
559.998000	19.6	1000.0	120.000	121.0	H	100.0	19.7	16.4	36.0	
725.515200	20.3	1000.0	120.000	98.0	V	80.0	23.1	15.7	36.0	
927.364800	22.6	1000.0	120.000	170.0	H	260.0	25.3	13.4	36.0	

Plot 2: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization

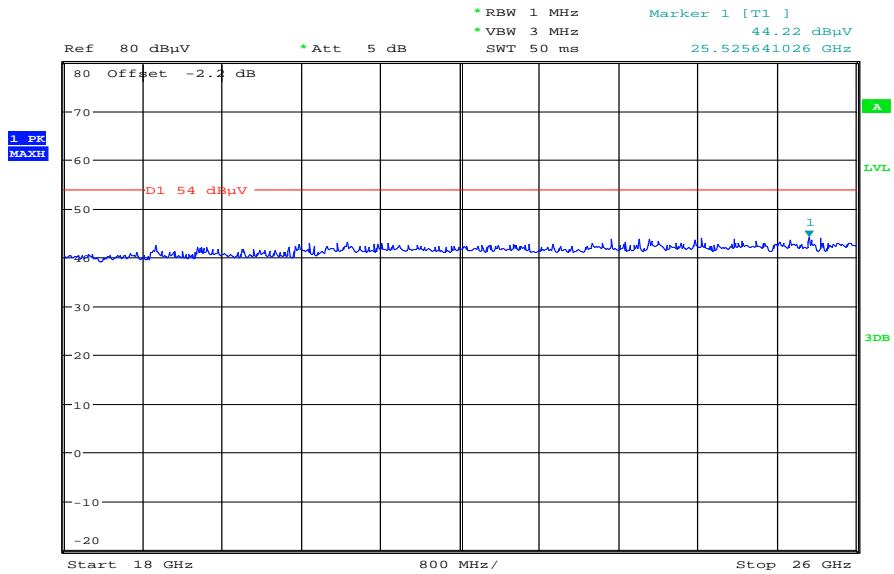


Plot 3: Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



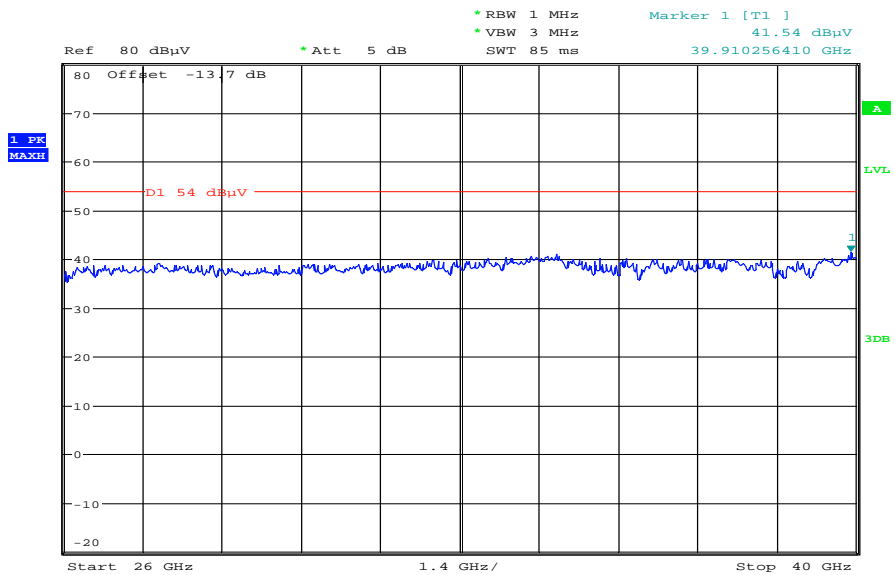
Date: 8.JAN.2013 11:13:42

Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 8.JAN.2013 11:49:42

Plot 5: Lowest channel, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 8.JAN.2013 12:46:22



Plot 6: Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization

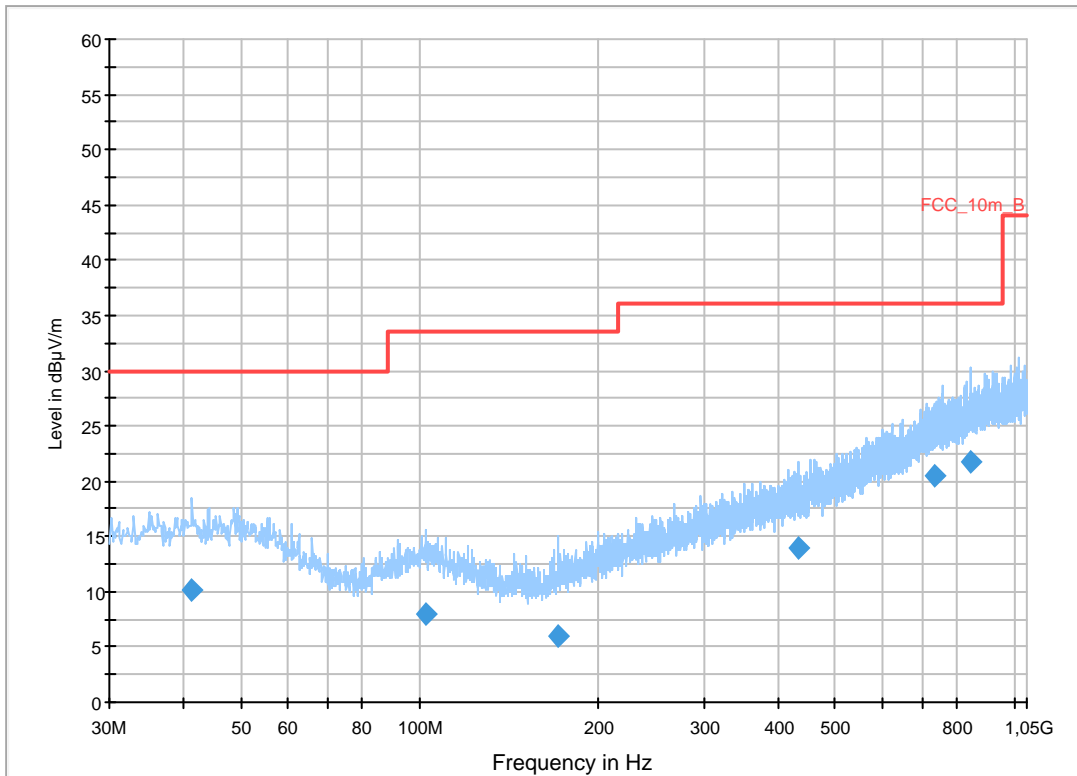
### Common Information

EUT: RFN81UW  
 Test Description: FCC part 15 B class B @ 10 m  
 Operating Conditions: 802.11A TX CH157 6MpS  
 Operator Name: Medrow  
 Comment: battery powered

### Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)  
 Receiver: [ESCI 3]  
 Level Unit: dBµV/m

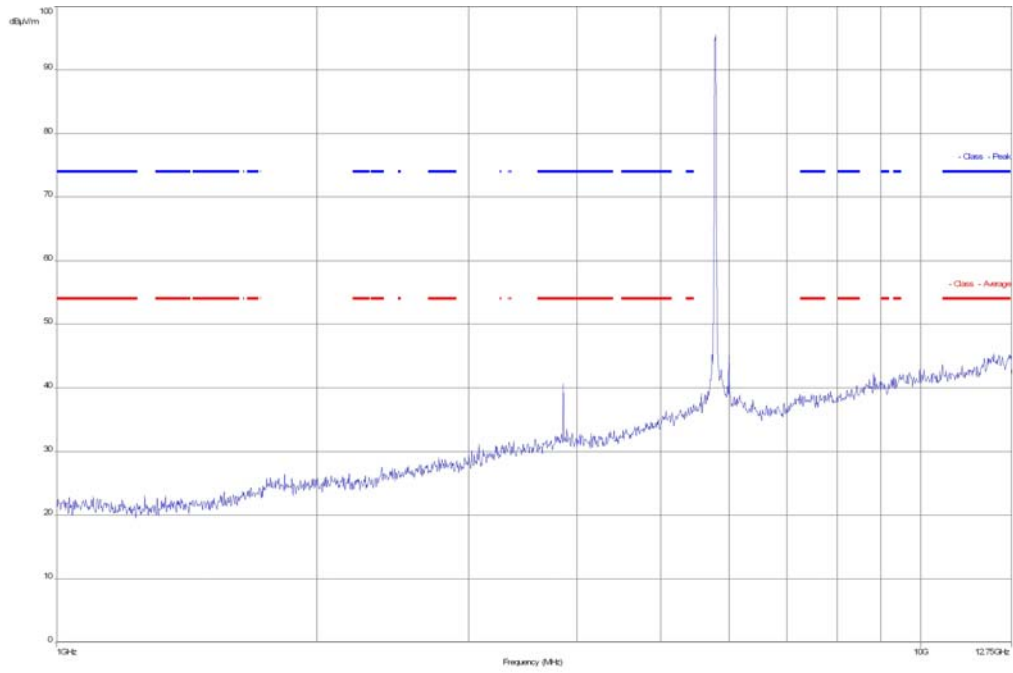
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB
FCC_10m(B)_3					



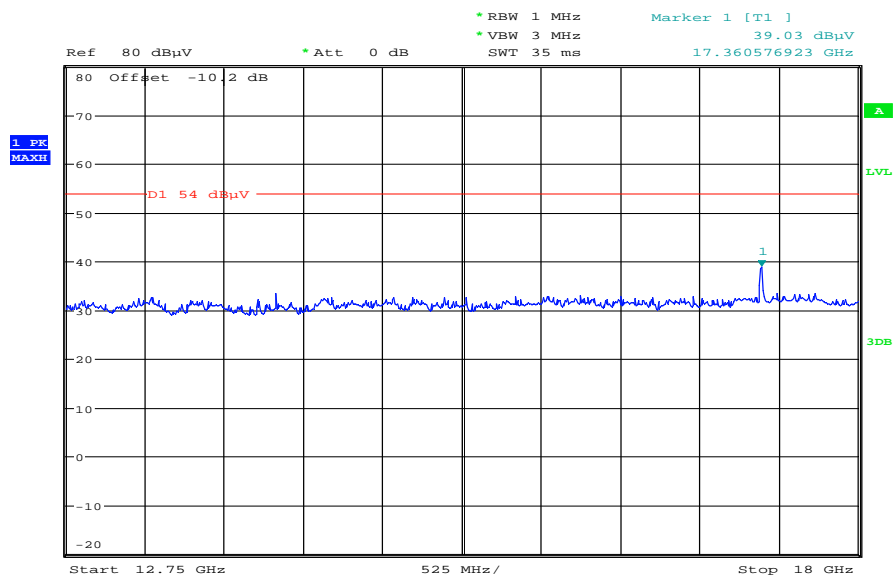
### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
41.088450	10.2	1000.0	120.000	170.0	H	274.0	13.4	19.8	30.0	
102.501150	8.0	1000.0	120.000	161.0	H	100.0	11.7	25.5	33.5	
171.140850	6.1	1000.0	120.000	170.0	V	92.0	9.9	27.4	33.5	
433.240950	13.9	1000.0	120.000	152.0	H	265.0	17.4	22.1	36.0	
734.073900	20.4	1000.0	120.000	170.0	V	280.0	23.3	15.6	36.0	
847.662300	21.7	1000.0	120.000	170.0	H	92.0	24.5	14.3	36.0	

Plot 7: Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization

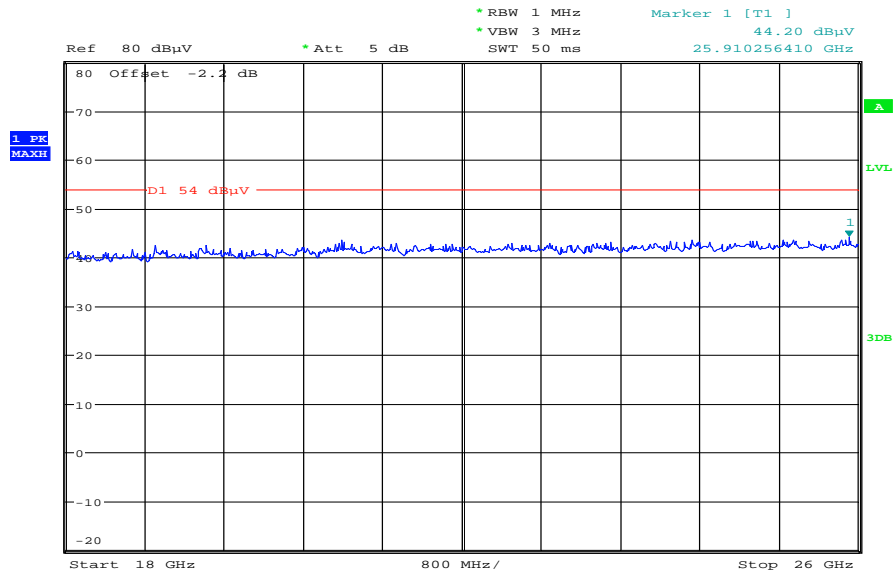


Plot 8: Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



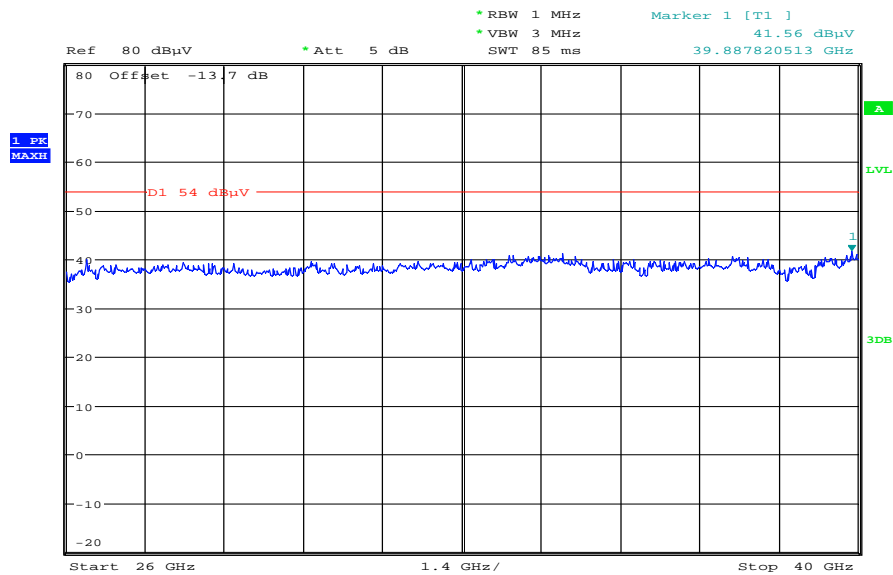
Date: 8.JAN.2013 11:14:43

Plot 9: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 8.JAN.2013 11:51:01

Plot 10: Middle channel, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 8.JAN.2013 12:47:50

Plot 11: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

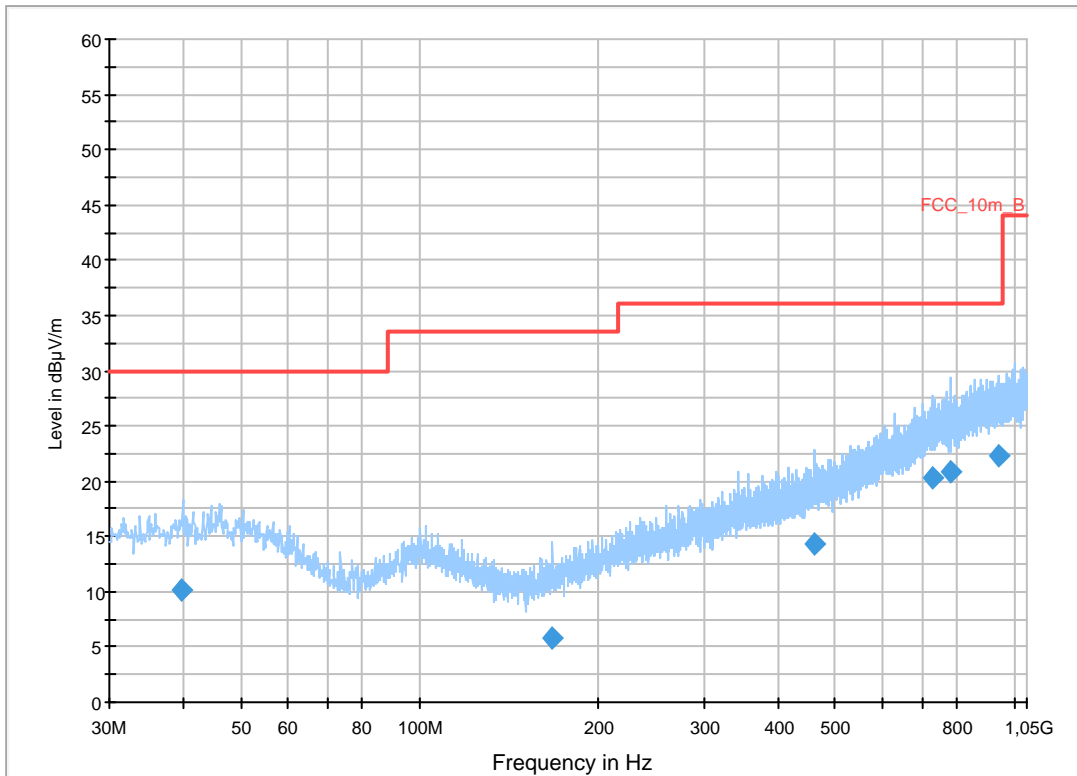
### Common Information

EUT: RFN81UW  
 Test Description: FCC part 15 B class B @ 10 m  
 Operating Conditions: 802.11A TX CH165 6MpS  
 Operator Name: Medrow  
 Comment: battery powered

### Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)  
 Receiver: [ESCI 3]  
 Level Unit: dBµV/m

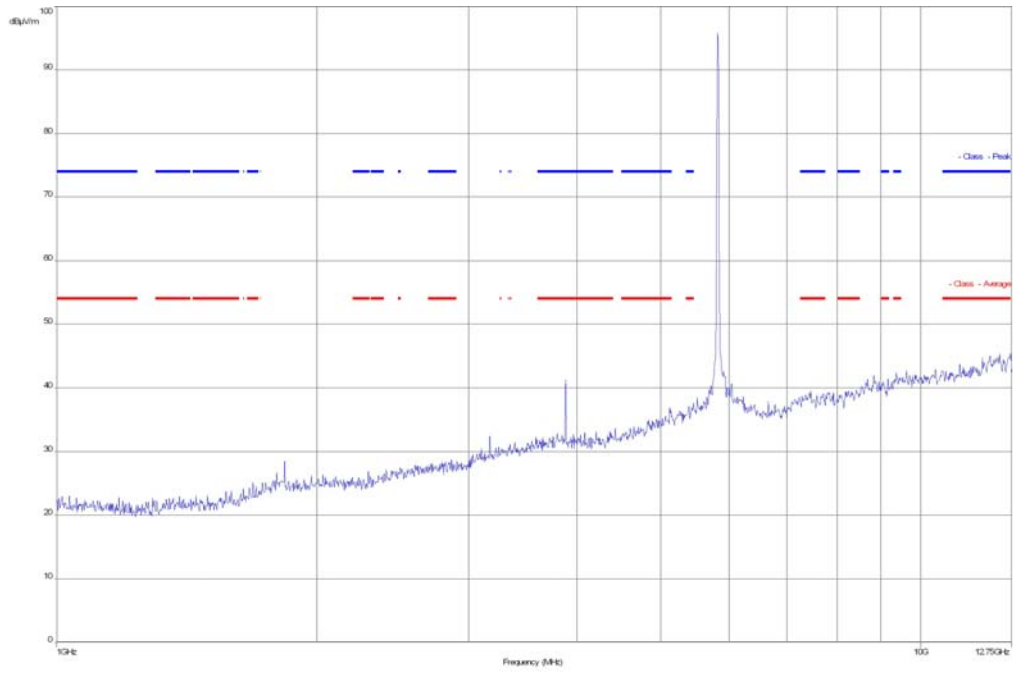
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB
FCC_10m(B)_3					



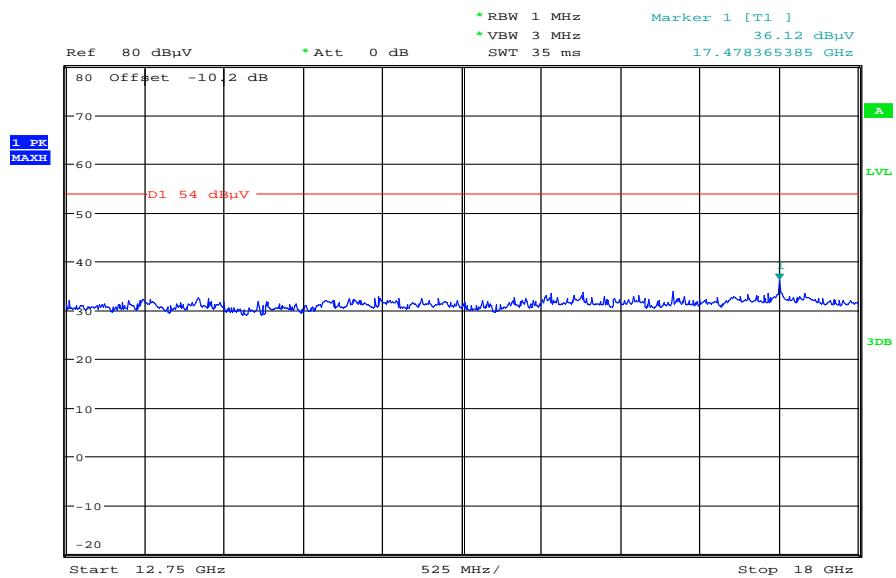
### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
39.663000	10.2	1000.0	120.000	162.0	V	182.0	13.4	19.8	30.0	
167.192700	5.8	1000.0	120.000	98.0	H	10.0	9.6	27.7	33.5	
460.577550	14.4	1000.0	120.000	170.0	H	190.0	17.9	21.6	36.0	
729.848700	20.3	1000.0	120.000	133.0	H	280.0	23.2	15.7	36.0	
784.008000	20.8	1000.0	120.000	98.0	V	177.0	23.8	15.2	36.0	
942.344700	22.4	1000.0	120.000	170.0	H	100.0	25.3	13.6	36.0	

**Plot 12:** Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization

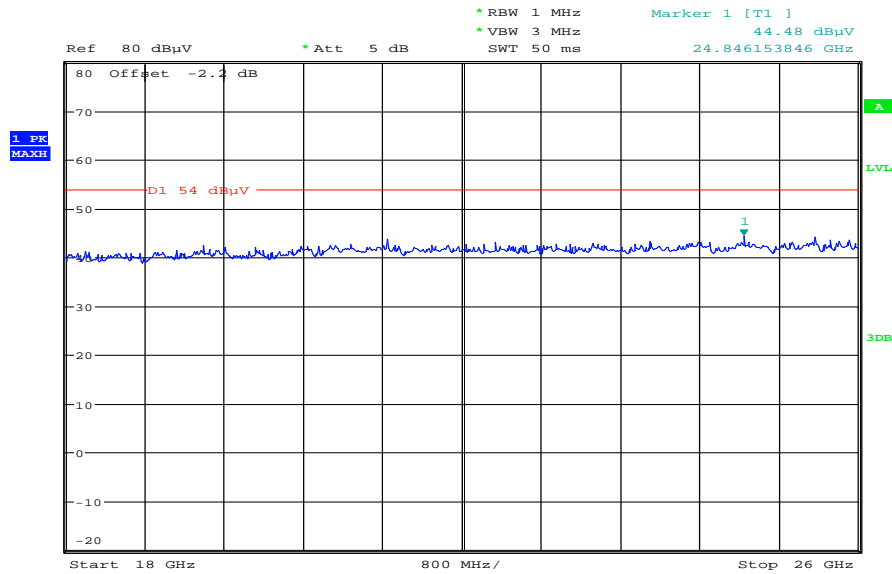


**Plot 13:** Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



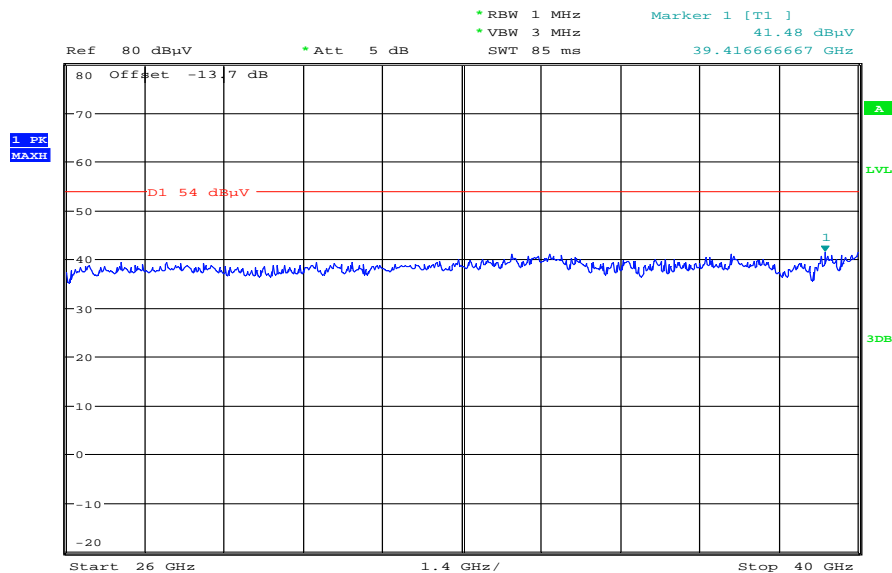
Date: 8.JAN.2013 11:15:50

Plot 14: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 8.JAN.2013 11:52:10

Plot 15: Highest channel, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 8.JAN.2013 12:48:56

**Plots: OFDM / n – mode**

**Plot 1:** Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

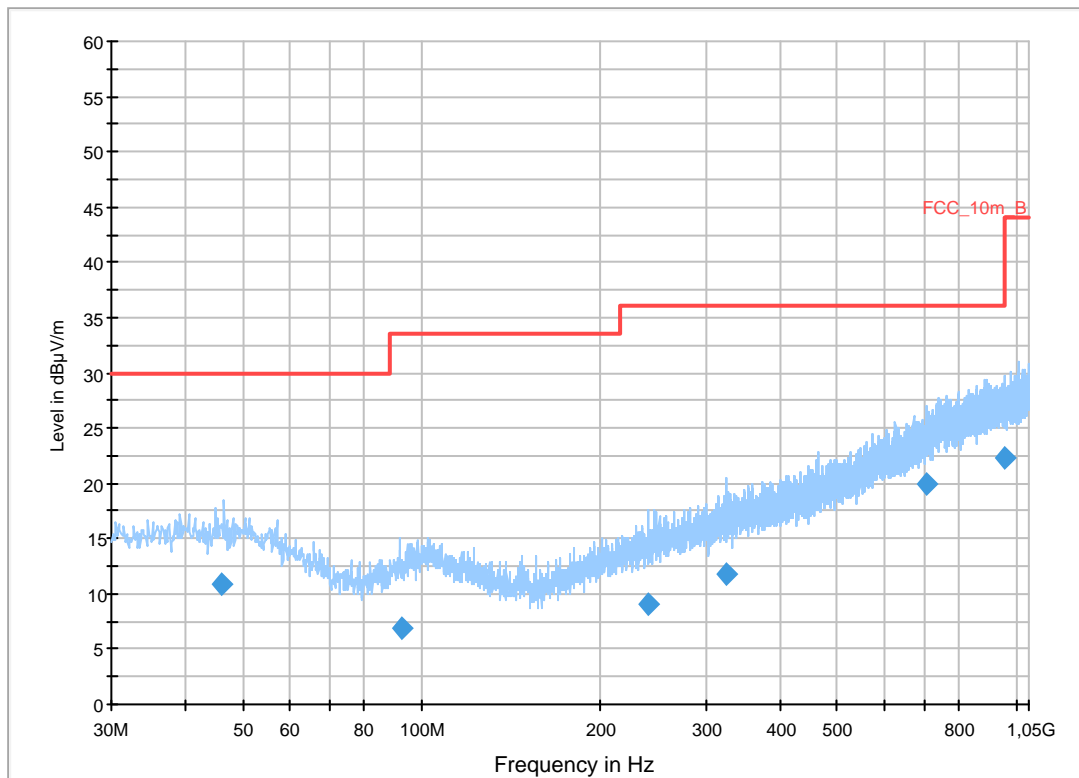
**Common Information**

EUT: RFN81UW  
 Test Description: FCC part 15 B class B @ 10 m  
 Operating Conditions: 802.11N TX CH149 MCS 0  
 Operator Name: Medrow  
 Comment: battery powered

**Scan Setup: STAN\_Fin [EMI radiated]**

Hardware Setup: Electric Field (NOS)  
 Receiver: [ESCI 3]  
 Level Unit: dBµV/m

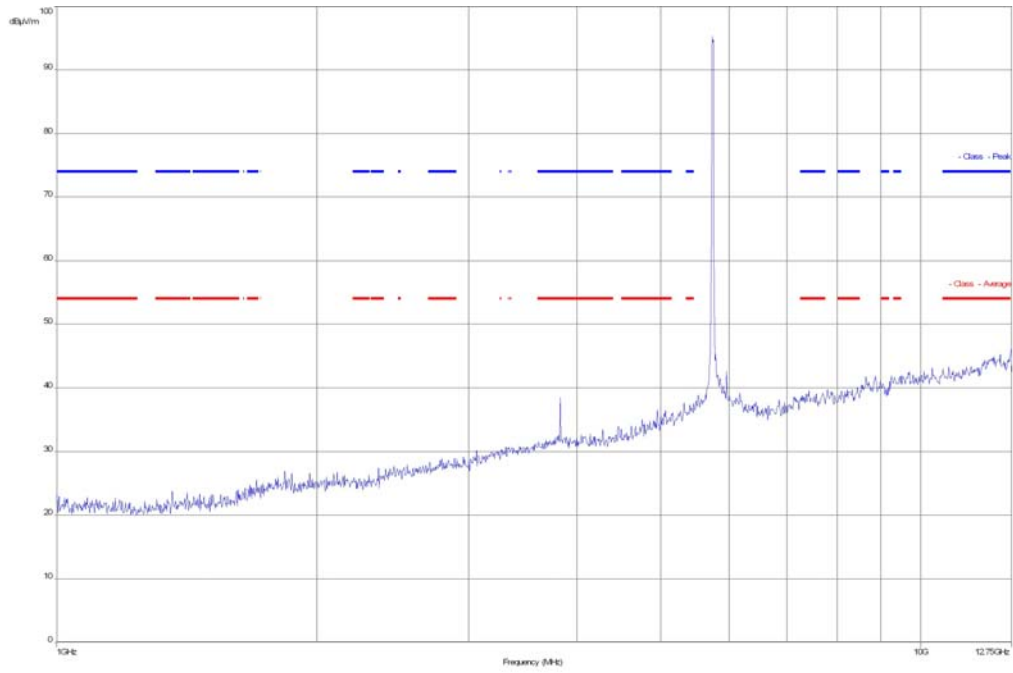
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK FCC_10m(B)_3	120 kHz	1 s	20 dB



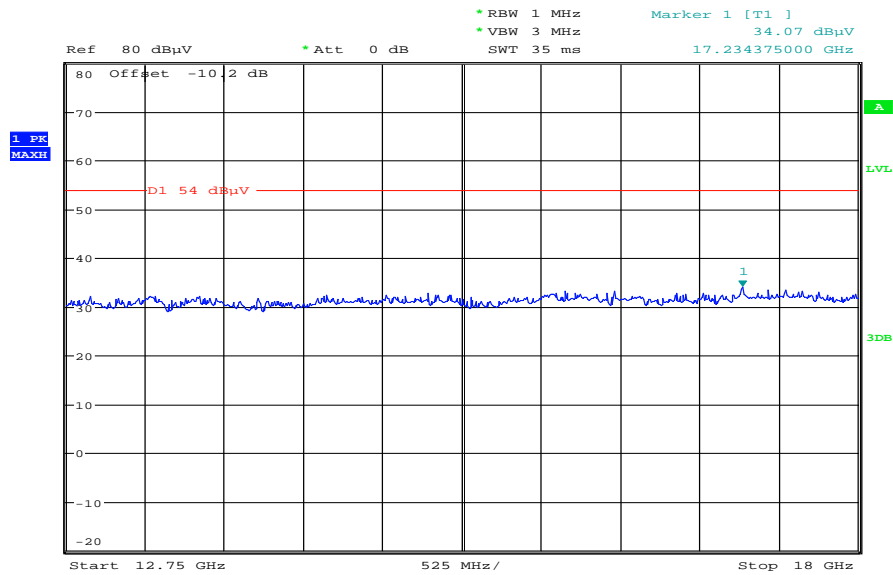
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
46.030650	10.8	1000.0	120.000	170.0	V	171.0	13.3	19.2	30.0	
92.258700	6.8	1000.0	120.000	170.0	V	100.0	10.9	26.7	33.5	
240.488100	9.1	1000.0	120.000	170.0	V	10.0	13.0	26.9	36.0	
324.270600	11.8	1000.0	120.000	104.0	H	10.0	15.3	24.2	36.0	
708.433050	20.0	1000.0	120.000	170.0	H	190.0	22.7	16.0	36.0	
955.268250	22.3	1000.0	120.000	170.0	H	182.0	25.4	13.7	36.0	

Plot 2: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



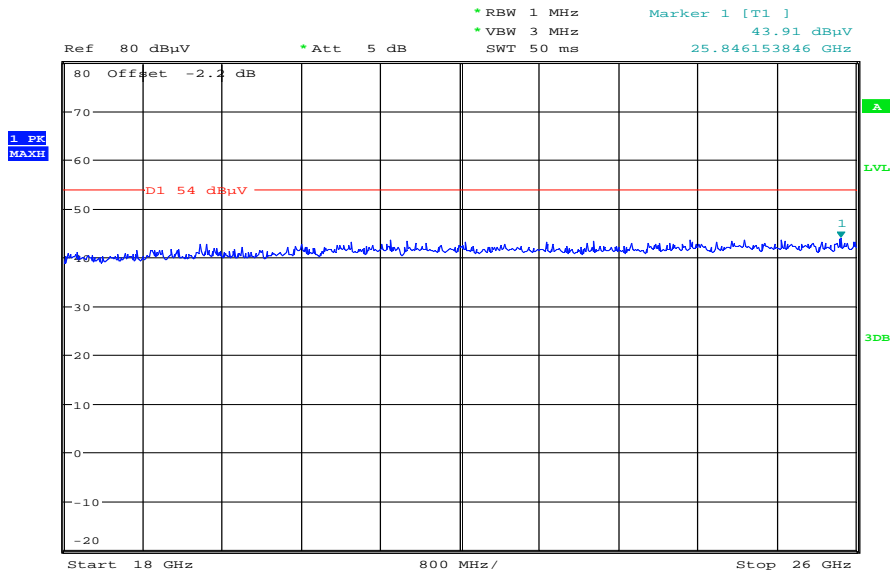
Plot 3: Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 8.JAN.2013 11:22:50

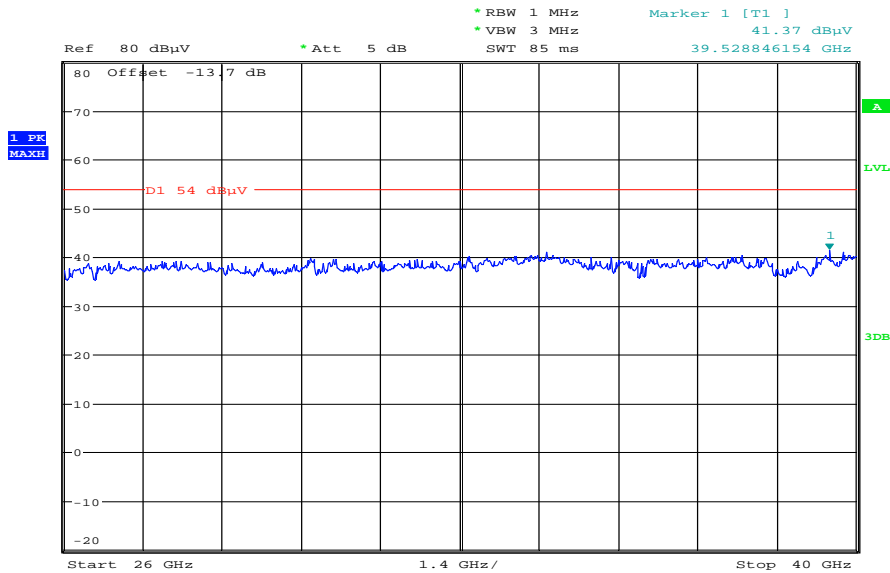


Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 8.JAN.2013 12:04:51

Plot 5: Lowest channel, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 8.JAN.2013 12:57:21

**Plot 6:** Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization

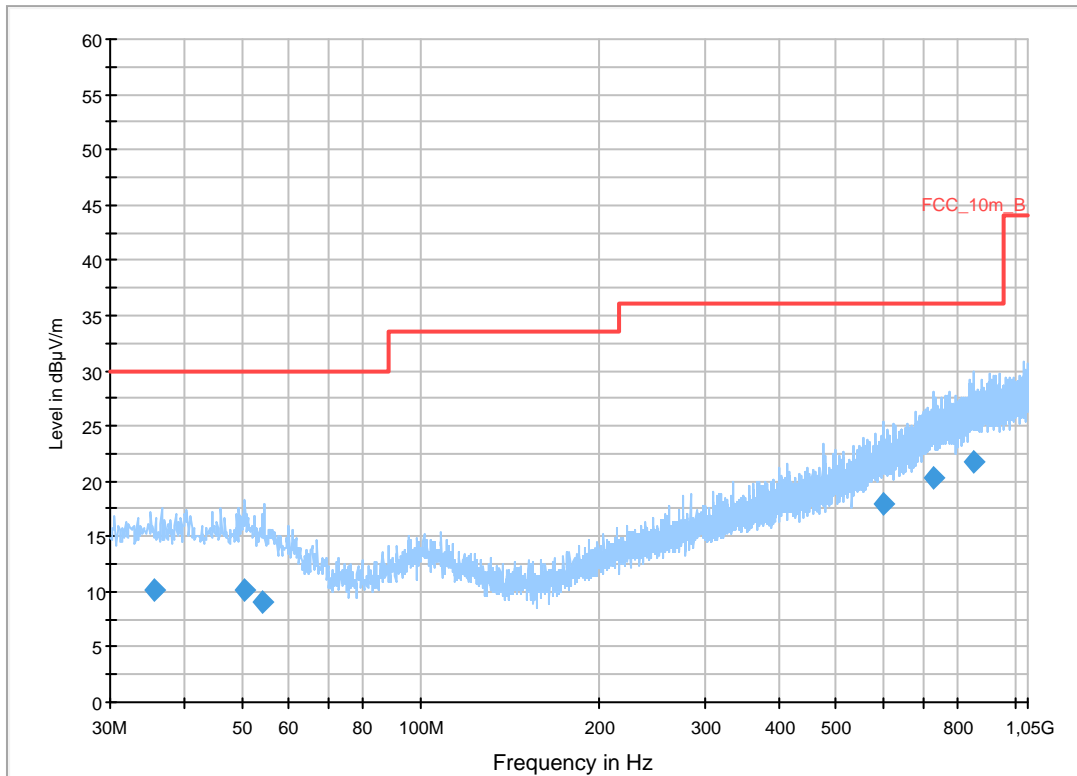
### Common Information

EUT: RFN81UW  
 Test Description: FCC part 15 B class B @ 10 m  
 Operating Conditions: 802.11N TX CH157 MCS 0  
 Operator Name: Medrow  
 Comment: battery powered

### Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)  
 Receiver: [ESCI 3]  
 Level Unit: dBµV/m

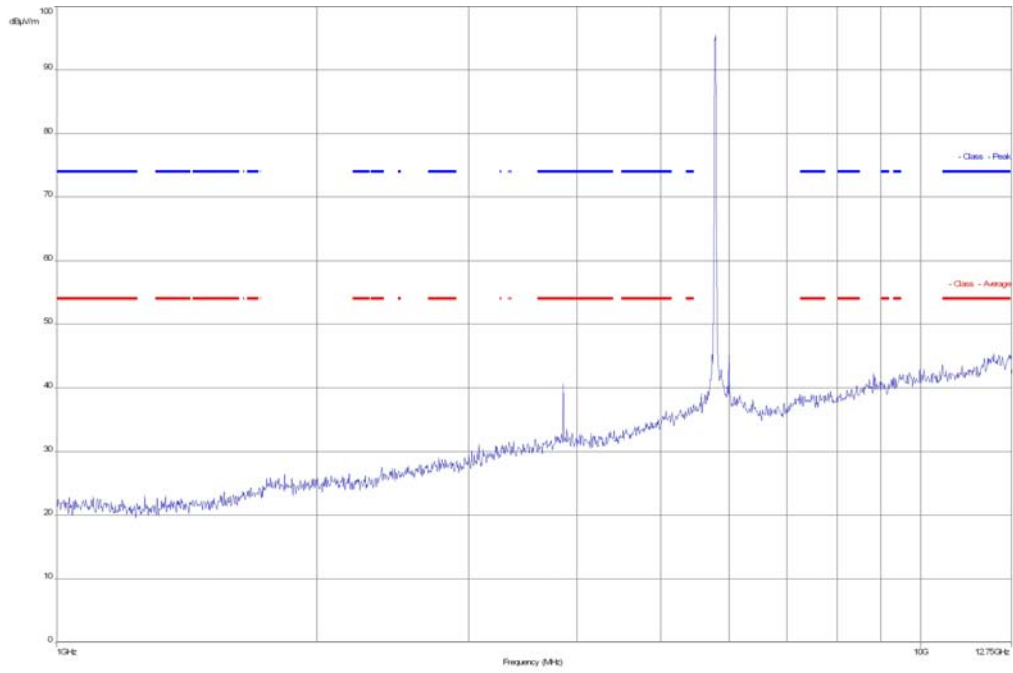
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB
FCC_10m(B)_3					



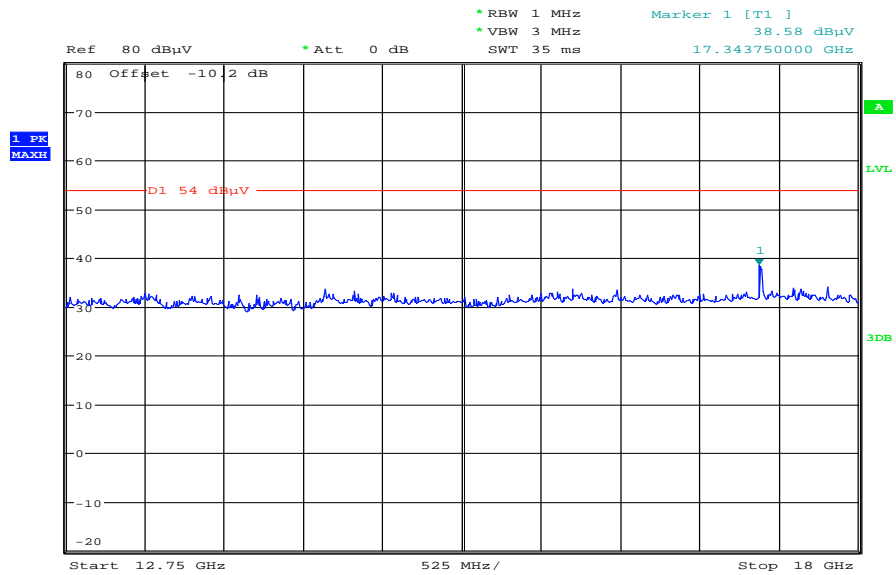
### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.545350	10.1	1000.0	120.000	170.0	H	2.0	13.1	19.9	30.0	
50.272350	10.1	1000.0	120.000	170.0	V	180.0	13.3	19.9	30.0	
54.137550	9.1	1000.0	120.000	170.0	V	2.0	13.0	20.9	30.0	
599.231550	18.0	1000.0	120.000	170.0	V	10.0	20.8	18.0	36.0	
730.451700	20.3	1000.0	120.000	170.0	V	-10.0	23.2	15.7	36.0	
852.705750	21.8	1000.0	120.000	170.0	H	280.0	24.6	14.2	36.0	

Plot 7: Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization

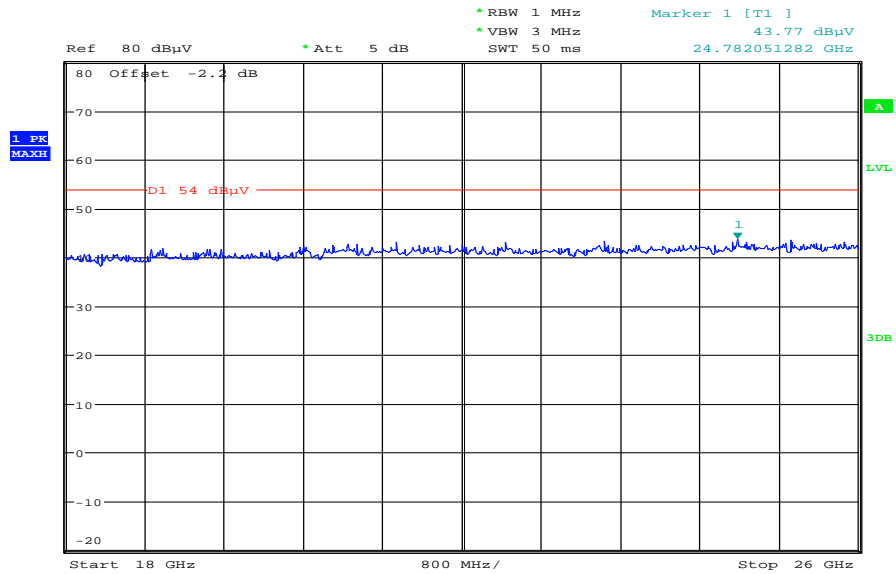


Plot 8: Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



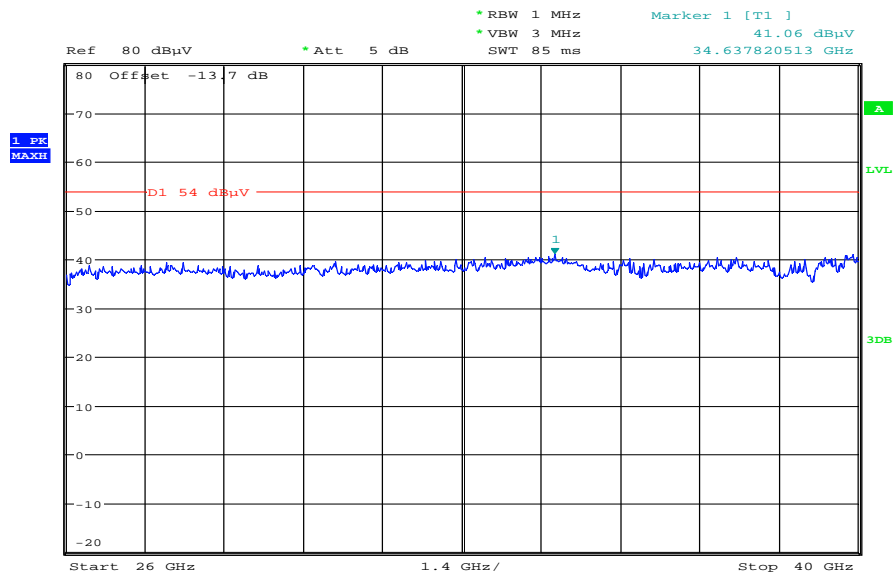
Date: 8.JAN.2013 11:24:02

Plot 9: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 8.JAN.2013 12:07:26

Plot 10: Middle channel, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 8.JAN.2013 12:58:11

**Plot 11:** Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

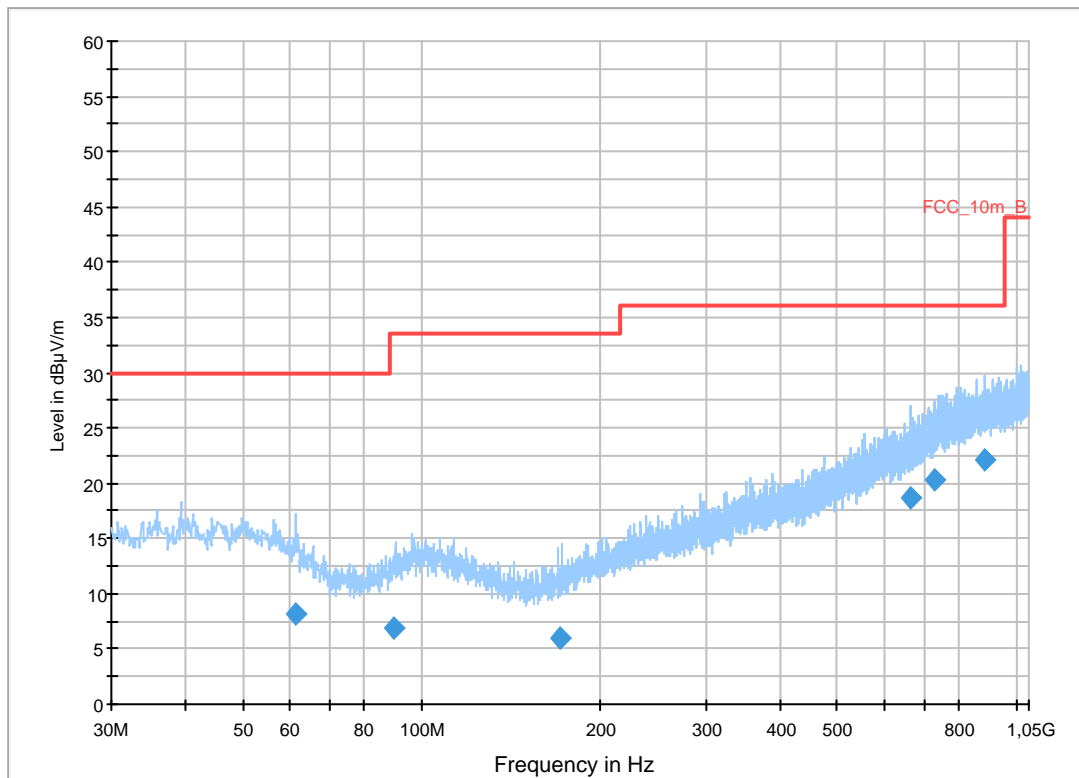
**Common Information**

EUT: RFN81UW  
 Test Description: FCC part 15 B class B @ 10 m  
 Operating Conditions: 802.11N TX CH165 MCS 0  
 Operator Name: Medrow  
 Comment: battery powered

**Scan Setup: STAN\_Fin [EMI radiated]**

Hardware Setup: Electric Field (NOS)  
 Receiver: [ESCI 3]  
 Level Unit: dBµV/m

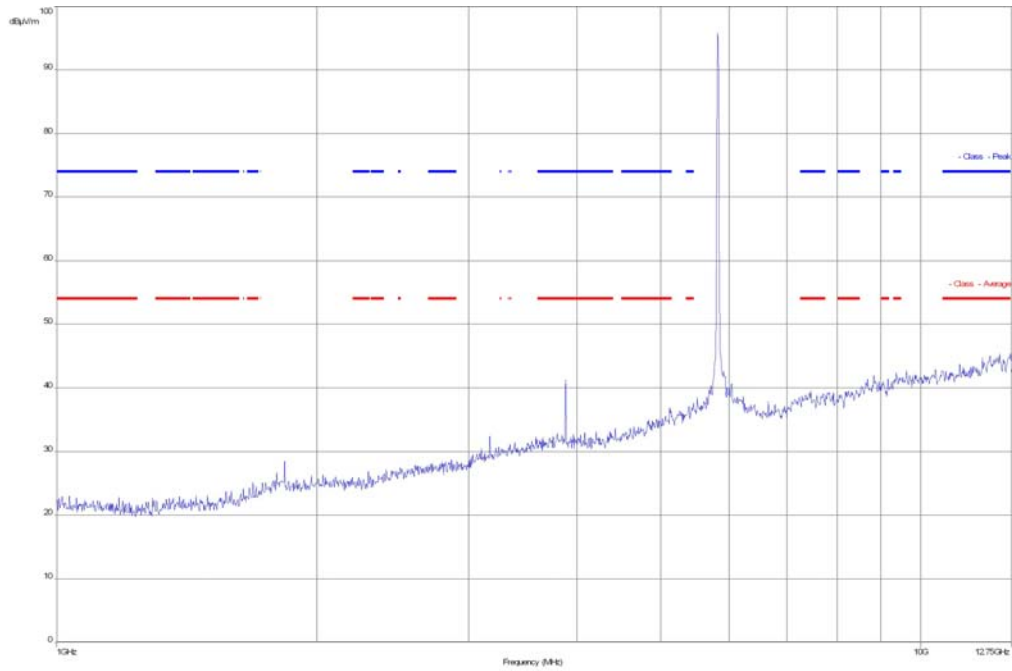
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB
FCC_10m(B)_3					



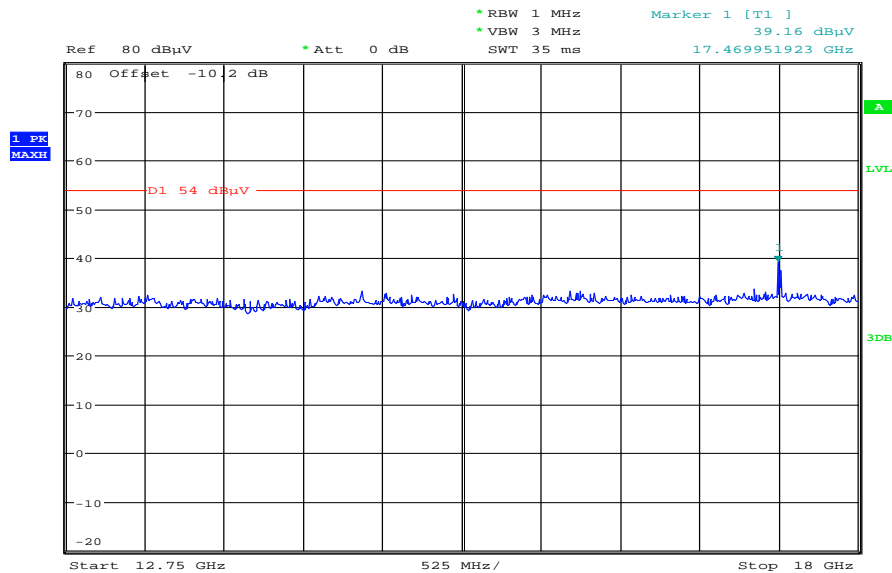
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
61.189350	8.1	1000.0	120.000	120.0	H	-3.0	11.3	21.9	30.0	
89.913900	6.9	1000.0	120.000	170.0	H	280.0	10.5	26.6	33.5	
170.966100	6.0	1000.0	120.000	98.0	H	90.0	9.9	27.5	33.5	
666.163500	18.7	1000.0	120.000	170.0	H	85.0	21.6	17.3	36.0	
730.563450	20.3	1000.0	120.000	170.0	H	-9.0	23.2	15.7	36.0	
887.809350	22.2	1000.0	120.000	120.0	H	170.0	25.0	13.8	36.0	

Plot 12: Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization

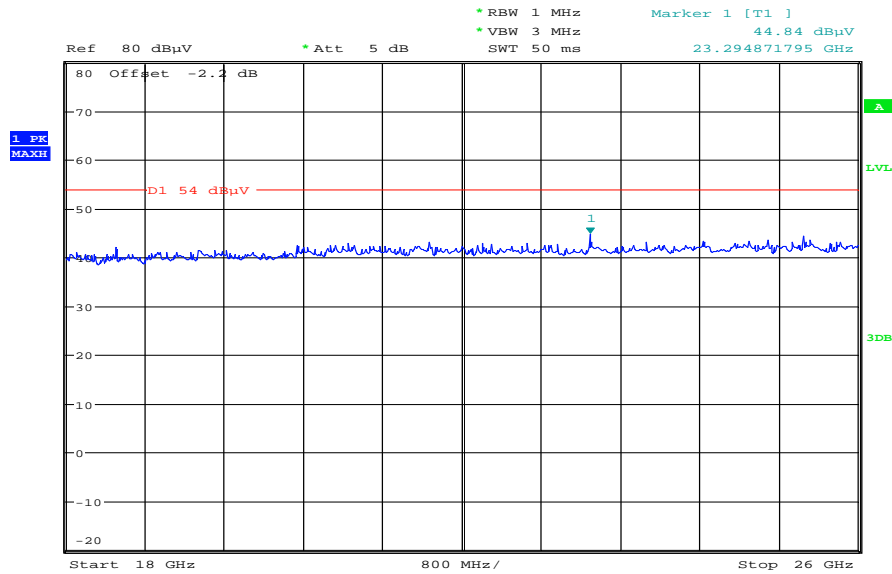


Plot 13: Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



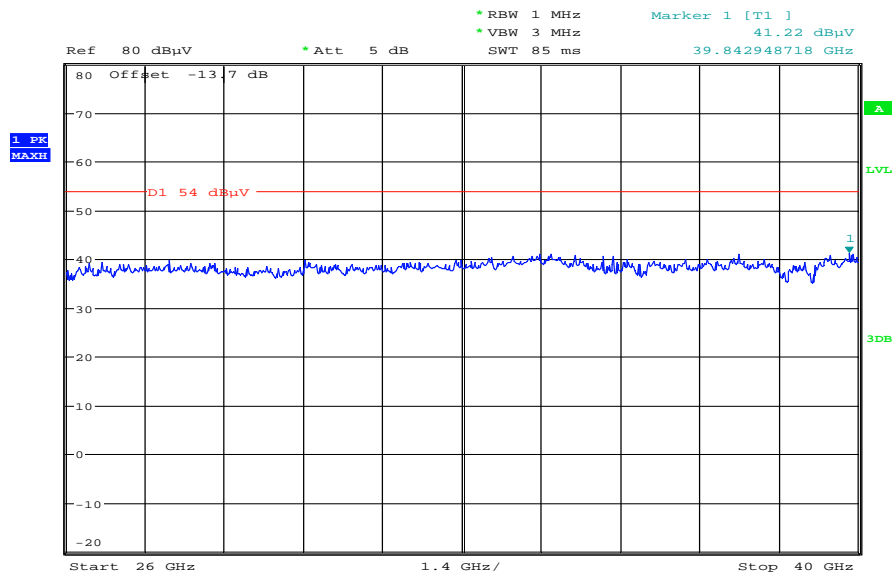
Date: 8.JAN.2013 11:33:14

Plot 14: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 8.JAN.2013 12:13:08

Plot 15: Highest channel, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 8.JAN.2013 12:59:07

#### 9.12 RX spurious emissions radiated

Not performed!

#### 9.13 Spurious emissions radiated < 30 MHz

Not performed!

#### 9.14 Spurious emissions conducted < 30 MHz

Not performed!



## 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	45	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368	g		
2	50	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580	ne		
3	n. a.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081;B597 9	300000210	ne		
4	n. a.	EMI Test Receiver	ESCI 1166.5950. 03	R&S	100083	300003312	k		
5	n. a.	Analyzer- Reference- System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	k	14.07.2011	14.07.2013
6	n. a.	Amplifier	JS42- 00502650- 28-5A	MITEQ	1084532	300003379	ev		
7	n. a.	Antenna Tower	Model 2175	ETS- LINDGREN	64762	300003745	izw		
8	n. a.	Positioning Controller	Model 2090	ETS- LINDGREN	64672	300003746	izw		
9	n. a.	Turntable Interface-Box	Model 105637	ETS- LINDGREN	44583	300003747	izw		
10	n. a.	TRIOLOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbe ck	295	300003787	k	12.04.2012	12.04.2014
11	n. a.	Spectrum- Analyzer	FSU26	R&S	200809	300003874	k	06.01.2012	06.01.2014
12	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	12.01.2012	12.01.2015
13	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vIKI!	11.05.2011	11.05.2013
14	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
15	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
16	9	Isolating Transformer	MPL IEC625 Bus Regeltrennt ravo	Erfi	91350	300001155	ne		
17	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
18	n. a.	TRIOLOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbe ck	371	300003854	vIKI!	14.10.2011	14.10.2014
19	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologi es	MY51210197	300004405	k		
20	n. a.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	Ve	09.10.2012	09.10.2014
21	CR 79	Std. Gain Horn Antenna 26.5- 40.0 GHz	V637	Narda	7911	300001751	ne		

22	11b	Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268	ev		
23	A026	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda		300000787	ne		
24	A029	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda		300002442	ne		
25	n. a.	Broadband Low Noise Amplifier 18-50 GHz	CBL18503 070-XX	CERNEX	19338	300004273	ne		

**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
vkl!	Attention: extended calibration interval		
NK!	Attention: not calibrated	*)	next calibration ordered / currently in progress

## 11 Observations

No observations exceeding those reported with the single test cases have been made.

## Annex A Document history

Version	Applied changes	Date of release
1.0	Initial release	2013-01-09
-A	Addition of HW / SW status and FCC / IC number	2013-02-18
-B	Editorial changes	2013-03-08
-C	Band edge measurements according part 15.407 added	2013-03-21
-D	Band edge measurements according part 15.407 removed	2013-03-25
-E	Band edge measurements according part 15.247 added	2013-03-28

## Annex B Further information

### Glossary

AVG	-	Average
DUT	-	Device under test
EMC	-	Electromagnetic Compatibility
EN	-	European Standard
EUT	-	Equipment under test
ETSI	-	European Telecommunications Standard Institute
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	Not applicable
PP	-	Positive peak
QP	-	Quasi peak
S/N	-	Serial number
SW	-	Software

**Annex C Accreditation Certificate**



Deutsche Akkreditierungsstelle GmbH  
German Accreditation Body

Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV  
Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition

**Accreditation**



The Deutsche Akkreditierungsstelle GmbH (German Accreditation Body) attests that the testing laboratory

**CETECOM ICT Services GmbH**  
Untertürkheimer Straße 6-10  
66117 Saarbrücken

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

- Wired communications and DECT
- Acoustic
- Radio
- Shirt Range Devices (SRD)
- RFID
- WiMax and Richtfunk
- Mobile radio (GSM / DCS), Over the Air (OTA) Performance
- Electromagnetic Compatibility (EMC) incl. Automotive
- Product safety
- SAR and Hearing Aid Compatibility (HAC)
- Environmental simulation
- Smart Card Terminals
- Bluetooth
- Wi-Fi-Services

The accreditation certificate shall only apply in connection with the notice of accreditation of 13.04.2011 with the accreditation number D-PL-12076-01 and is valid until 03.09.2014. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 82 pages.

Registration number of the certificate: **D-PL-12076-01-01**

Frankfurt am Main, 13.04.2011

Dipl.-Ing. (FH) Dr. Egner  
Head of Division 2

This document is a translation. The definitive version is the original German accreditation certificate.  
[www.dakks.de](http://www.dakks.de)

Deutsche Akkreditierungsstelle GmbH

Office Berlin  
Spittelmarkt 10  
10117 Berlin

Office Frankfurt am Main  
Gartenstraße 6  
60594 Frankfurt am Main

Office Braunschweig  
Bundesallee 100  
38116 Braunschweig

The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAKKS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAKKS.

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008; p. 30). DAKKS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.

The up-to-date state of membership can be retrieved from the following websites:  
EA: [www.european-accreditation.org](http://www.european-accreditation.org)  
ILAC: [www.ilac.org](http://www.ilac.org)  
IAF: [www.iaf.eu](http://www.iaf.eu)

Front side of certificate

Back side of certificate

**Note:**

The current certificate including annex is published on our website (see link below) or may be received from CETECOM ICT Services on request.

[http://www.cetecom.com/fileadmin/de/CETECOM\\_D\\_Saarbruecken/accreditations\\_Jan\\_2010/DAKKS\\_Akkredi\\_Urk\\_EN17025-En\\_incl\\_Annex.pdf](http://www.cetecom.com/fileadmin/de/CETECOM_D_Saarbruecken/accreditations_Jan_2010/DAKKS_Akkredi_Urk_EN17025-En_incl_Annex.pdf)