

TEST REPORT

Test report no.: 1-6234/13-01-03-A



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

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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:	RFU81UW
FCC ID:	L6ARFU80UW
IC:	2503A-RFU80UW
Frequency:	DTS band 2400 MHz to 2483.5 MHz (lowest channel 00 – 2402 MHz, highest channel 78 – 2480 MHz)
Technology tested:	Bluetooth®, +EDR
Antenna:	Integrated antenna
Power supply:	3.7 V DC by Li - Ion battery
Temperature:	+24

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:



Stefan Bös
Senior Testing Manager

Test performed:



Marco Bertolino
Testing Manager

1 Table of contents	
1	Table of contents2
2	General information3
2.1	Notes and disclaimer3
2.2	Application details.....3
3	Test standard/s3
4	Test environment.....4
5	Test item4
5.1	Additional information4
6	Test laboratories sub-contracted4
7	Description of the test setup.....5
7.1	Radiated measurements chamber F.....5
7.2	Radiated measurements chamber C6
7.3	Radiated measurements 12.75 GHz to 25 GHz7
7.4	AC conducted8
8	Summary of measurement results9
9	Additional comments10
10	Measurement results11
10.1	Antenna gain11
10.2	Power spectral density.....11
10.3	Carrier frequency separation.....11
10.4	Number of hopping channels11
10.5	Time of occupancy (dwell time)11
10.6	Spectrum bandwidth of a FHSS system – 20 dB bandwidth.....11
10.7	Maximum output power.....11
10.8	Band edge compliance conducted11
10.9	Band edge compliance radiated.....12
10.10	TX spurious emissions conducted17
10.11	TX spurious emissions radiated18
10.12	RX spurious emissions radiated47
10.13	Spurious emissions radiated < 30 MHz51
10.14	Spurious emissions conducted < 30 MHz.....52
11	Test equipment and ancillaries used for tests.....55
12	Observations56
Annex A	Document history57
Annex B	Further information.....57
Annex C	Accreditation Certificate58

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:	2013-05-10
Date of receipt of test item:	2013-05-27
Start of test:	2013-05-27
End of test:	2013-06-11
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15	2012-10	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

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:	60 %	
Barometric pressure:	not relevant for this kind of testing	
Power supply:	V_{nom}	3.7 V DC by Li - Ion battery
	V_{max}	-/- V
	V_{min}	-/- V

5 Test item

Kind of test item	:	Blackberry GSM Phones
Type identification	:	RFU81UW
S/N serial number	:	IMEI: 004402242283665 IMEI: 004401139558338
HW hardware status	:	CER-56900-001-Rev1-x03-00 (903)
SW software status	:	7.1.0.980 (b2678)
Frequency band [MHz]	:	DTS band 2400 MHz to 2483.5 MHz (lowest channel 00 – 2410 MHz, highest channel 78 – 2480 MHz)
Type of radio transmission	:	FHSS
Use of frequency spectrum	:	
Type of modulation	:	GFSK, Pi/4 DQPSK and 8 DPSK
Number of channels	:	79
Antenna	:	Integrated antenna
Power supply	:	3.7 V DC by Li - Ion battery
Temperature range	:	No range needed!

5.1 Additional information

Test setup - and EUT - photos are included in the following test reports:

External EUT photos: 1-6234/13-01-01_AnnexA
 Test setup: 1-6234/13-01-01_AnnexD

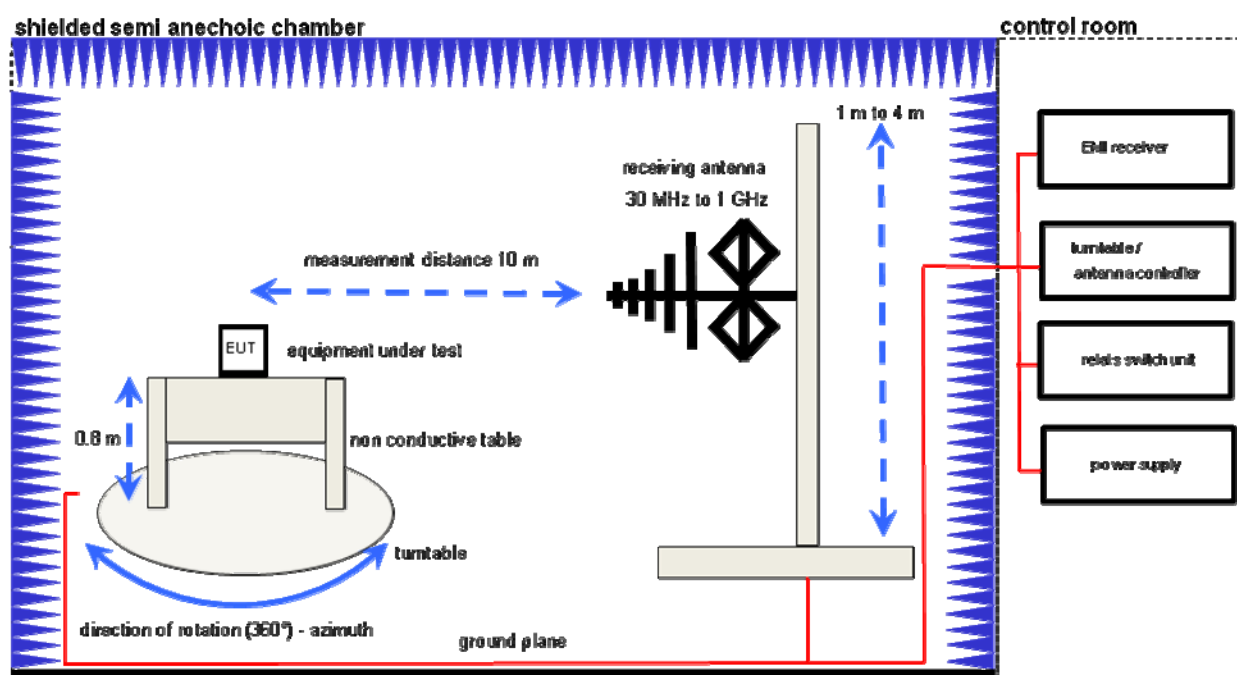
6 Test laboratories sub-contracted

None

7 Description of the test setup

7.1 Radiated measurements chamber F

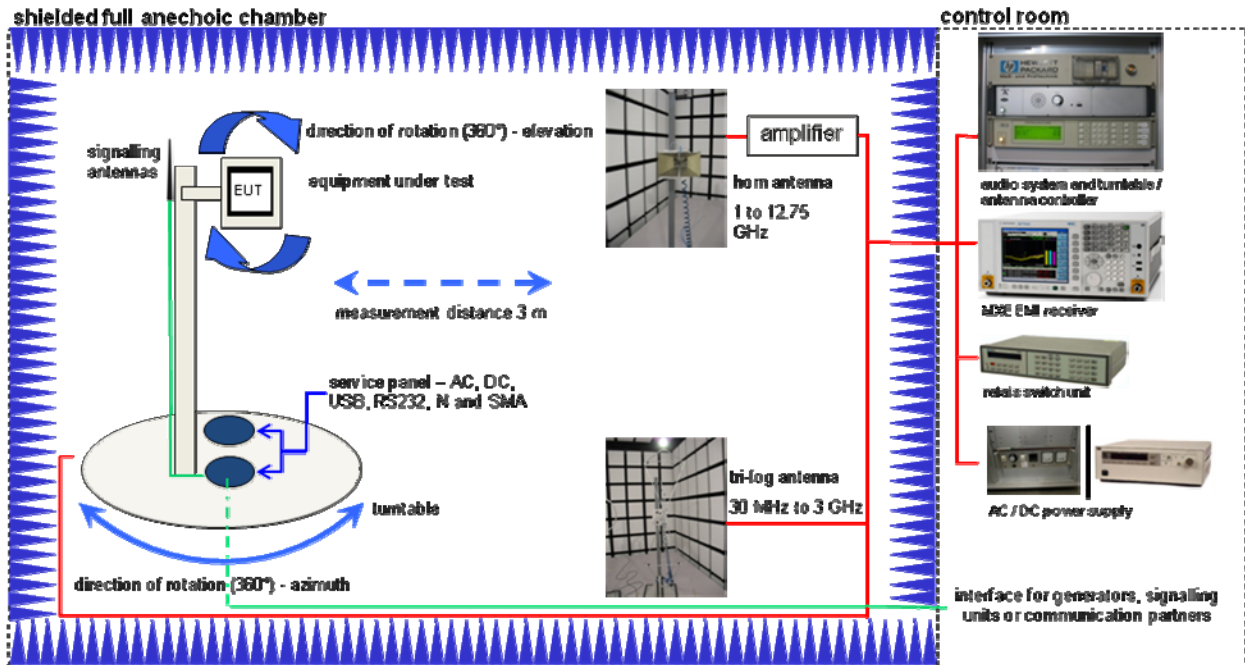
The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63. 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.



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368
DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580
EMI Test Receiver	ESCI 3	R&S	100083	300003312
Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379
Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745
Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746
Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747
TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787
CBT (Bluetooth Tester + EDR Signalling)	CBT 1153.9000K35, CBT-B55, CBT-K55	R&S	100313	300003516

7.2 Radiated measurements chamber C



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405
Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351
Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789
Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032
Active Loop Antenna	6502	EMCO	2210	300001015
Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996
Switch / Control Unit	3488A	HP Meßtechnik	*	300000199
Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156
Isolating Transformer	MPL IEC625 Bus Regeltrenntravo	Erfi	91350	300001155
Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997
Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143
CBT (Bluetooth Tester + EDR Signalling)	CBT 1153.9000K35, CBT-B55, CBT-K55	R&S	100313	300003516

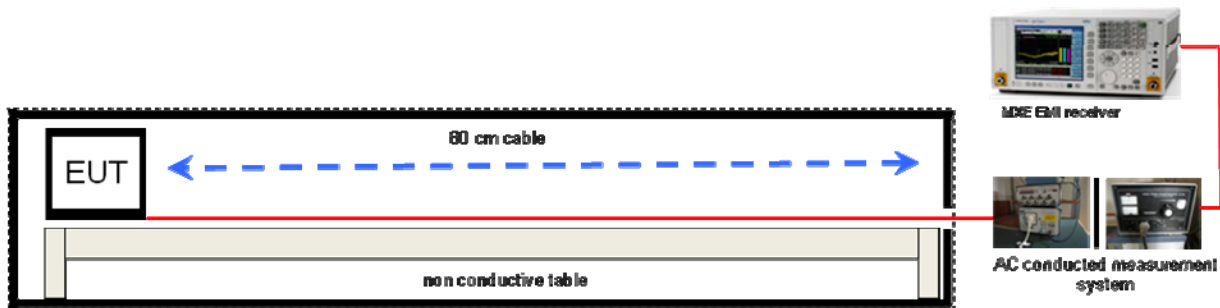
7.3 Radiated measurements 12.75 GHz to 25 GHz



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda		300000786
Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda		300000486
Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268
Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443
Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517

7.4 AC conducted



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405
Isolating Transformer	MPL IEC625 Bus Regeltrenntravo	Erfi	91350	300001155
Switch / Control Unit	3488A	HP Meßtechnik	*	300000199
Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001168
Artificial Mains 9 kHz to 30 MHz	ESH3-Z5	R&S	828576/020	300001210

8 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, Annex 8	Passed	2013-06-17	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	GFSK	<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	GFSK Pi/4 DQPSK 8 DPSK	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-/-
§15.247(a)(1) RSS 210 / A8.1(b)	Carrier frequency separation	Nominal	Nominal	GFSK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
§15.247(a)(1) RSS 210 / A8.1(d)	Number of hopping channels	Nominal	Nominal	GFSK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
§15.247(a)(1) (iii) RSS 210 / A8.3(1)	Time of occupancy (dwell time)	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
§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	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	-/-
§15.247(b)(1) RSS-210 / A8.4(2)	Maximum output power	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	-/-
§15.247(d) RSS-210 / A8.5	Band edge compliance conducted	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	-/-
§15.205 RSS-210 / A8.5	Band edge compliance radiated	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	complies
§15.247(d) RSS-210 / A8.5	TX spurious emissions conducted	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	-/-
§15.247(d) RSS-210 / A8.5	TX spurious emissions radiated	Nominal	Nominal	GFSK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.109 RSS-Gen	RX spurious emissions radiated	Nominal	Nominal	TX mode / acc. customer test plan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.209(a) RSS-Gen	TX spurious emissions radiated < 30 MHz	Nominal	Nominal	GFSK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
§15.107(a)	Conducted emissions < 30 MHz	Nominal	Nominal	GFSK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies

Note: NA = Not Applicable; NP = Not Performed

9 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

10 Measurement results

10.1 Antenna gain

Not performed – reduced test plan!

10.2 Power spectral density

Not performed – reduced test plan!

10.3 Carrier frequency separation

Not performed – reduced test plan!

10.4 Number of hopping channels

Not performed – reduced test plan!

10.5 Time of occupancy (dwell time)

Not performed – reduced test plan!

10.6 Spectrum bandwidth of a FHSS system – 20 dB bandwidth

Not performed – reduced test plan!

10.7 Maximum output power

Not performed – reduced test plan!

10.8 Band edge compliance conducted

Not performed – reduced test plan!

10.9 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:	1 MHz Peak / 10 Hz AVG
Resolution bandwidth:	1 MHz
Span:	Lower Band: 2370 – 2400 MHz Upper Band: 2480 – 2500 MHz
Trace-Mode:	Max Hold

Limits:

FCC	IC
Band edge compliance radiated	
<p>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)).</p>	
54 dB μ V/m AVG 74 dB μ V/m Peak	

Results GFSK:

Scenario	Band edge compliance radiated [dB μ V/m]		
	Result	Limit	Margin
Lower restricted band	27.1 AVG / 53.6 PP	54 AVG / 74 PP	26.9 dB / 20.4 dB
Upper restricted band	28.0 AVG / 44.3 PP	54 AVG / 74 PP	26.0 dB / 29.7 dB
Measurement uncertainty	± 3 dB		

Result: Passed

Results Pi/4 DQPSK:

Scenario	Band edge compliance radiated [dB μ V/m]		
	Result	Limit	Margin
Lower restricted band	27.4 AVG / 53.1 PP	54 AVG / 74 PP	26.6 dB / 20.9 dB
Upper restricted band	28.6 AVG / 45.1 PP	54 AVG / 74 PP	25.4 dB / 28.9 dB
Measurement uncertainty	± 3 dB		

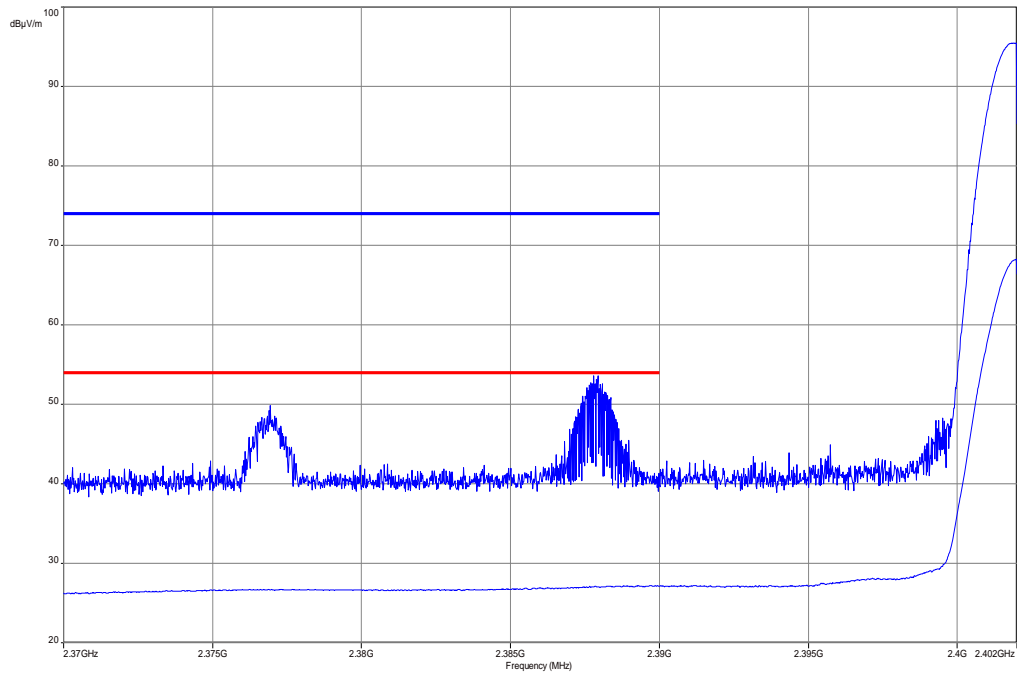
Result: **Passed****Results 8DPSK:**

Scenario	Band edge compliance radiated [dB μ V/m]		
	Result	Limit	Margin
Lower restricted band	27.4 AVG / 53.5 PP	54 AVG / 74 PP	26.6 dB / 20.5 dB
Upper restricted band	28.2 AVG / 45.4 PP	54 AVG / 74 PP	25.8 dB / 28.6 dB
Measurement uncertainty	± 3 dB		

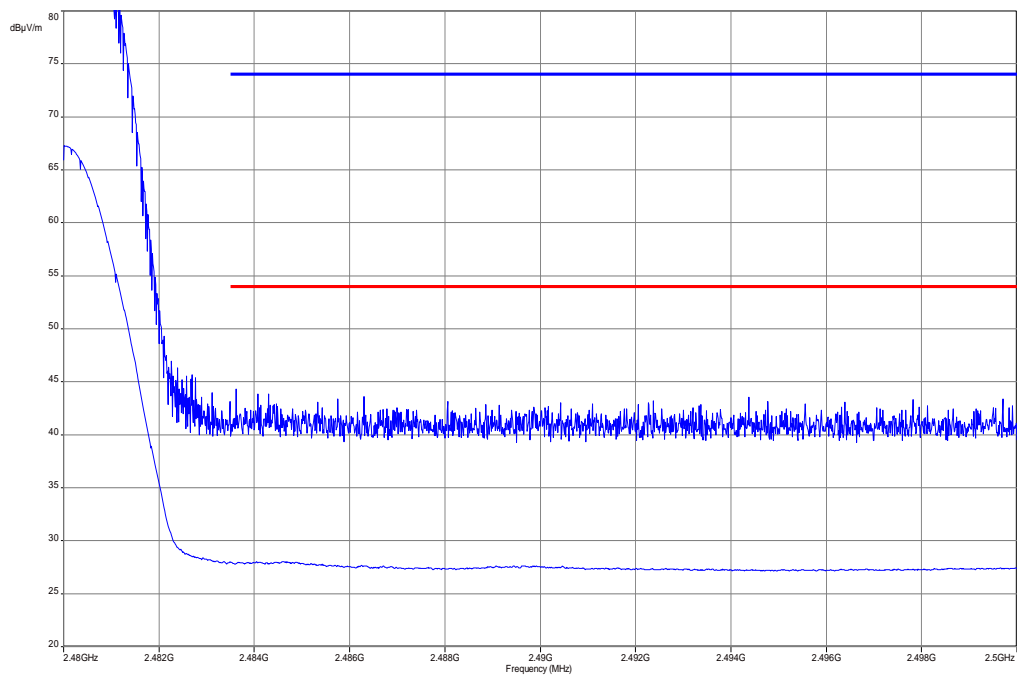
Result: **Passed**

Plots:

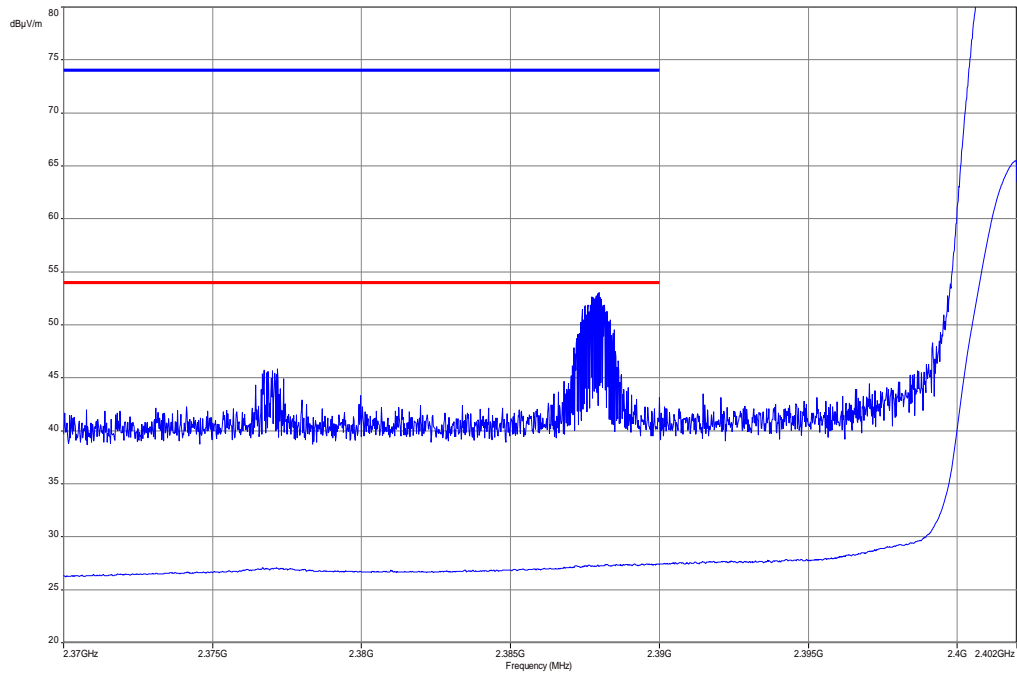
Plot 1: Lower band edge, GFSK modulation, vertical & horizontal polarization



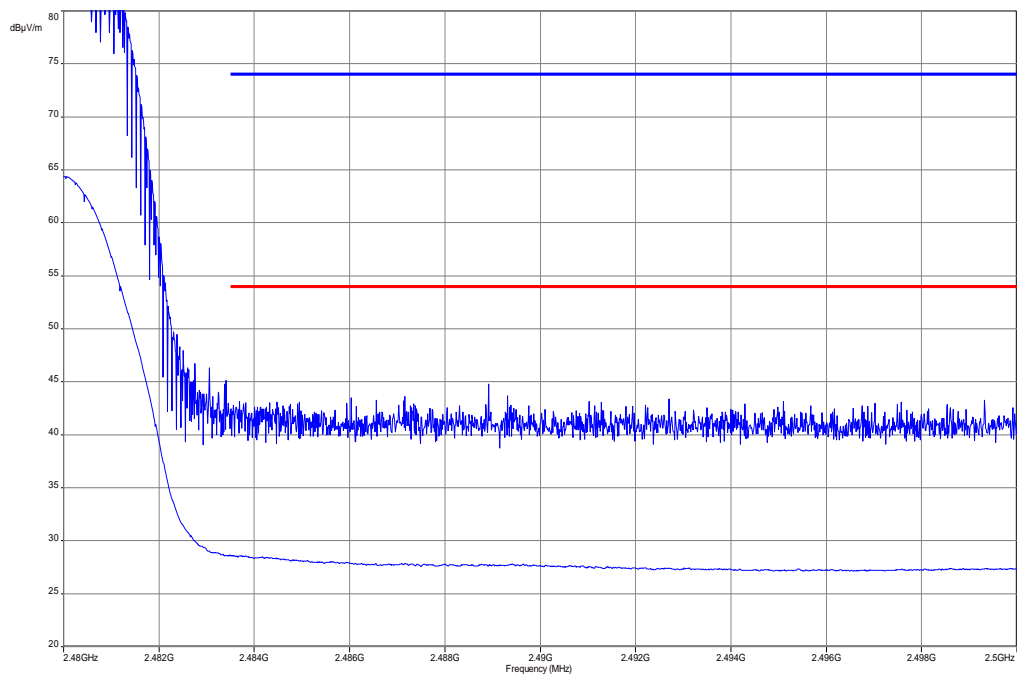
Plot 2: Upper band edge, GFSK modulation, vertical & horizontal polarization



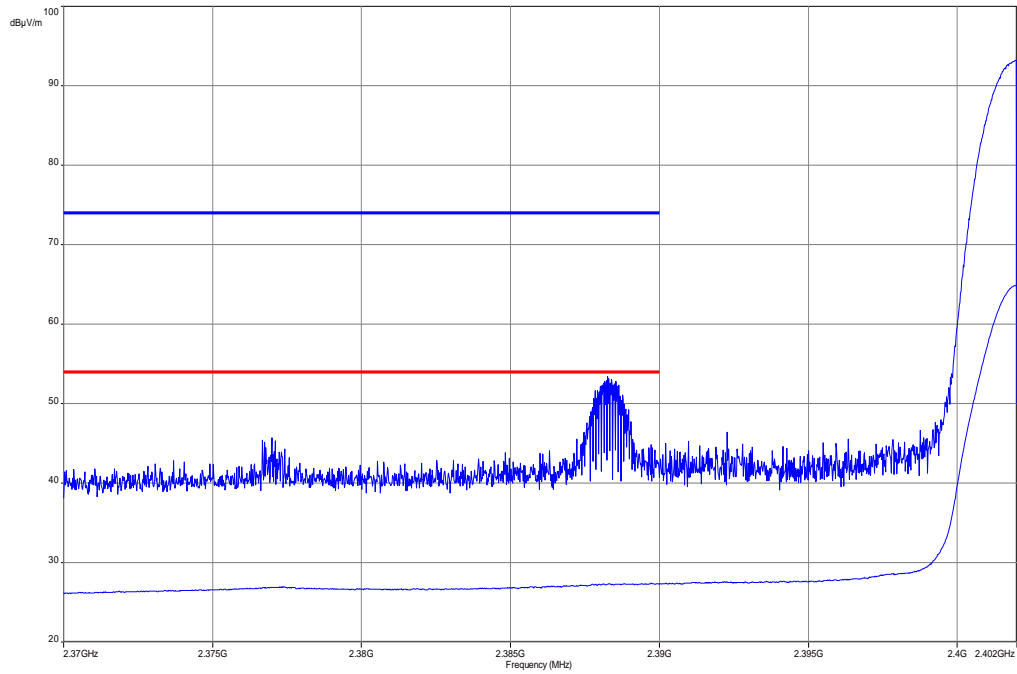
Plot 3: Lower band edge, Pi/4 DQPSK modulation, vertical & horizontal polarization



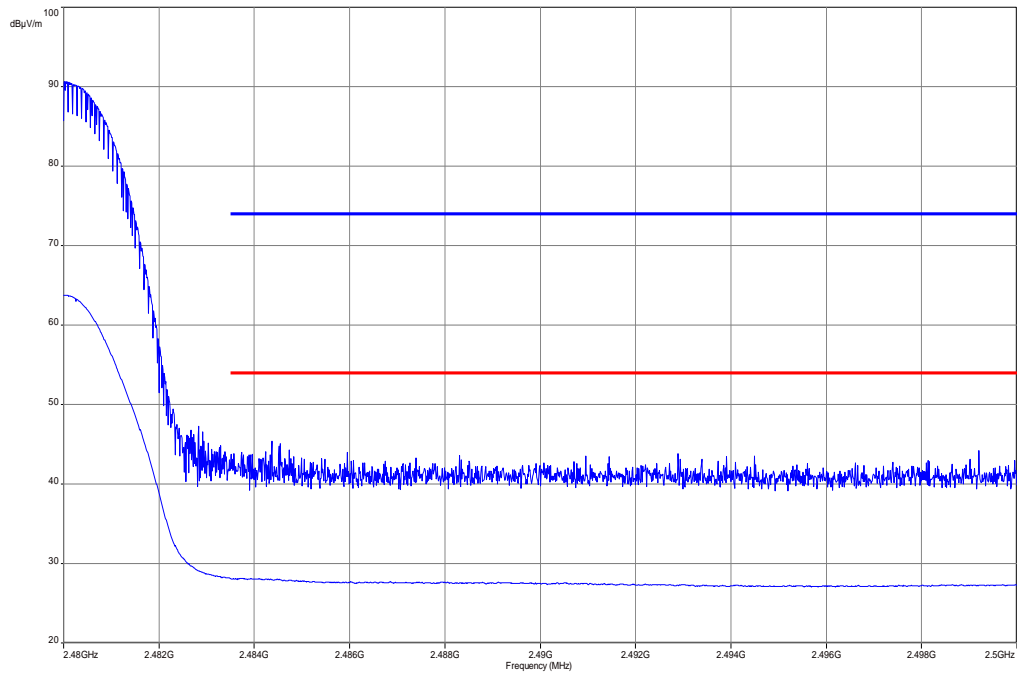
Plot 4: Upper band edge, Pi/4 DQPSK modulation, vertical & horizontal polarization



Plot 5: Lower band edge, 8 DPSK modulation, vertical & horizontal polarization



Plot 6: Upper band edge, 8 DPSK modulation, vertical & horizontal polarization



10.10 TX spurious emissions conducted

Not performed – reduced test plan!

10.11 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 26 GHz
Trace-Mode:	Max Hold
Measured Modulation:	<input checked="" type="checkbox"/> GFSK <input checked="" type="checkbox"/> Pi/4 DQPSK <input checked="" type="checkbox"/> 8DPSK

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)).			
§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	

Results: GFSK

TX spurious emissions radiated [dB μ V/m]								
2402 MHz			2441 MHz			2480 MHz		
F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]
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.		
All detected peak emissions are more than 6 dB below the average limit.			All detected peak emissions are more than 6 dB below the average limit.			All detected peak emissions are more than 6 dB below the average limit.		
Measurement uncertainty			± 3 dB					

Result: Passed

Results: Pi/4 DQPSK

TX spurious emissions radiated [dB μ V/m]								
2402 MHz			2441 MHz			2480 MHz		
F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]
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.		
All detected peak emissions are more than 6 dB below the average limit.			All detected peak emissions are more than 6 dB below the average limit.			All detected peak emissions are more than 6 dB below the average limit.		
Measurement uncertainty			± 3 dB					

Result: Passed

Results: 8 DPSK

TX spurious emissions radiated [dB μ V/m]								
2402 MHz			2441 MHz			2480 MHz		
F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]
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.		
All detected peak emissions are more than 6 dB below the average limit.			All detected peak emissions are more than 6 dB below the average limit.			All detected peak emissions are more than 6 dB below the average limit.		
Measurement uncertainty			± 3 dB					

Result: Passed

Plots: GFSK

Plot 1: 30 MHz to 1 GHz, TX mode, channel 00, vertical & horizontal polarization

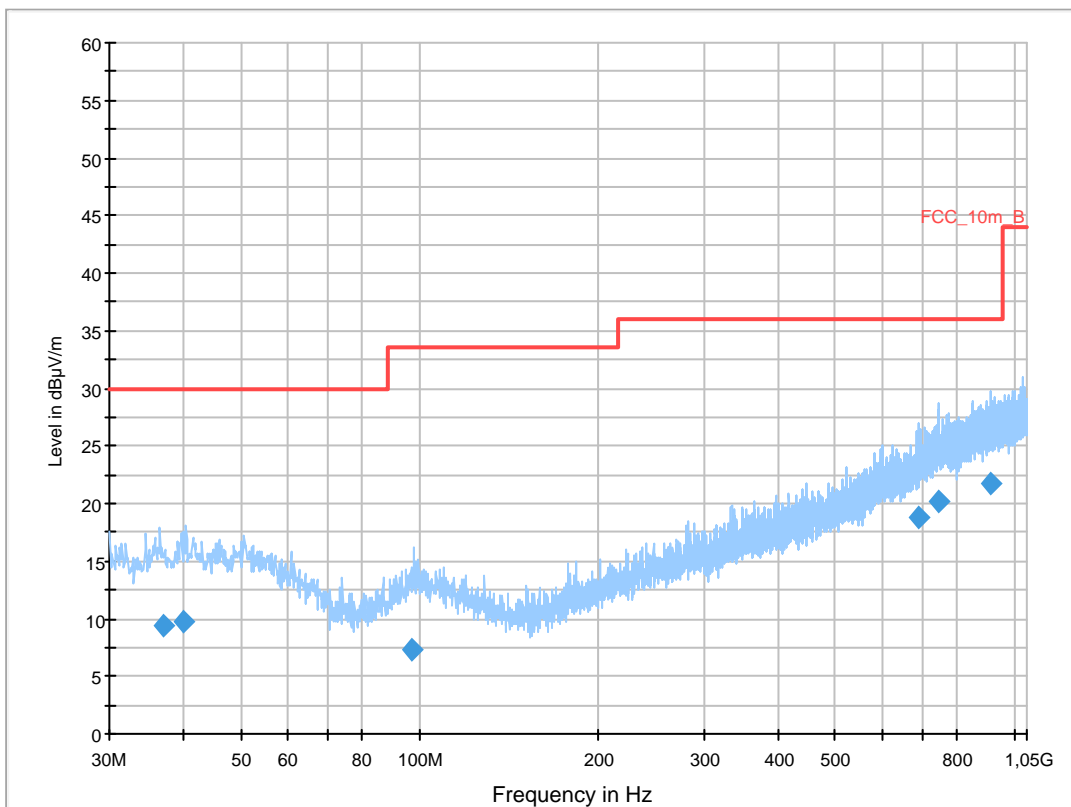
Common Information

EUT: RFU81UW
 Serial Number: IMEI: 004401.13.955833.8
 Test Description: FCC part 15 C class B @ 10 m
 Operating Conditions: BT TX Ch. 0 (DH5)
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

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

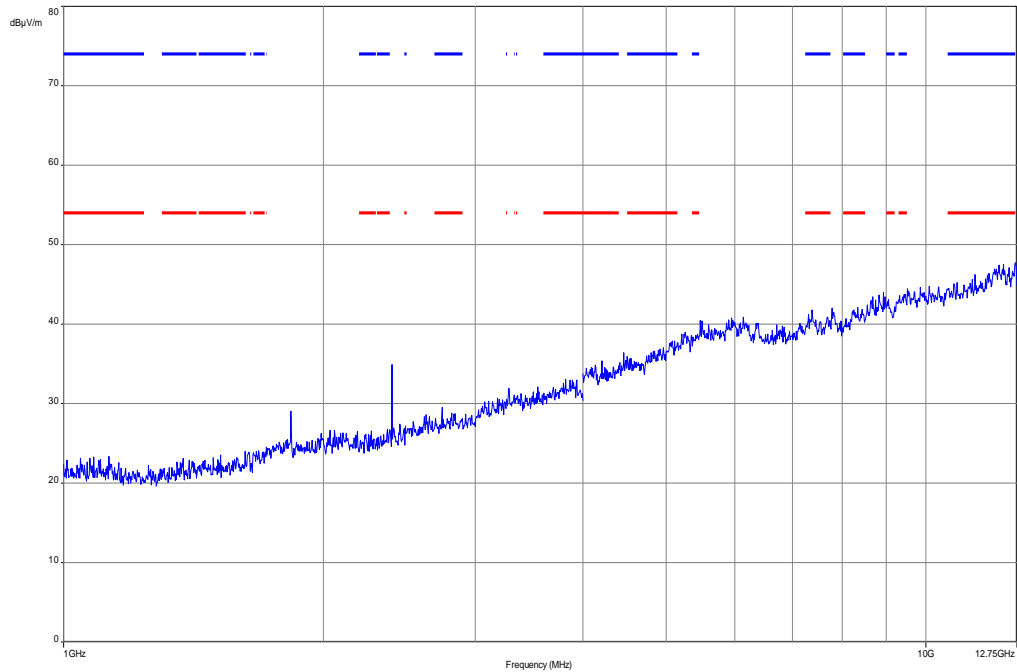
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



Final Result 1

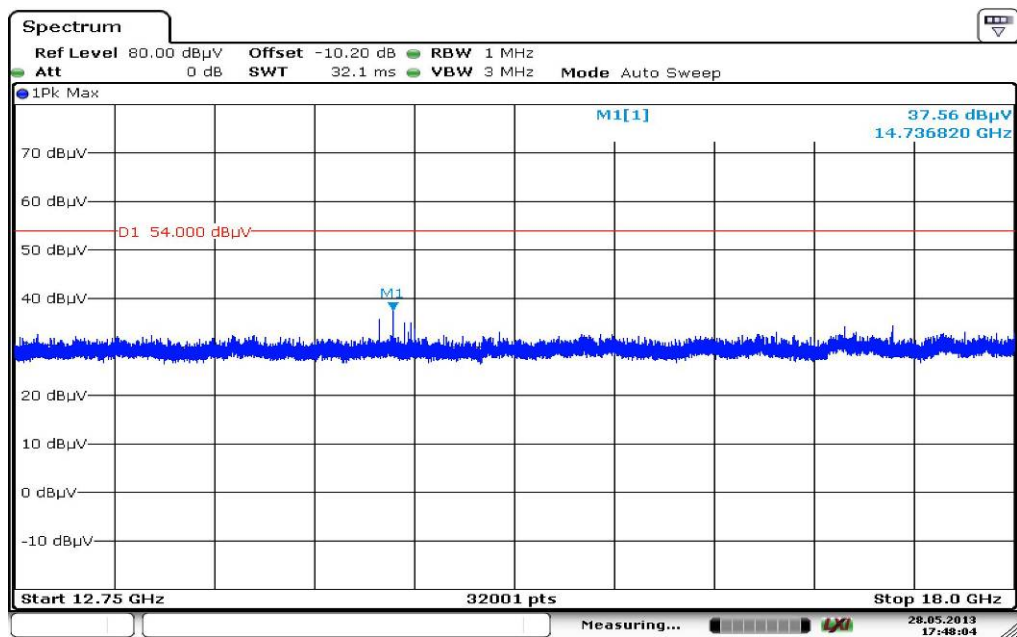
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
36.990750	9.5	1000.0	120.000	120.0	V	171.0	13.2	20.5	30.0	
39.994500	9.8	1000.0	120.000	170.0	H	-2.0	13.4	20.2	30.0	
96.965850	7.3	1000.0	120.000	98.0	H	266.0	11.5	26.2	33.5	
689.471100	18.8	1000.0	120.000	121.0	V	178.0	22.2	17.2	36.0	
744.740700	20.2	1000.0	120.000	98.0	V	178.0	23.5	15.8	36.0	
914.496600	21.8	1000.0	120.000	170.0	V	266.0	25.2	14.2	36.0	

Plot 2: 1 GHz to 12.75 GHz, TX mode, channel 00, vertical & horizontal polarization

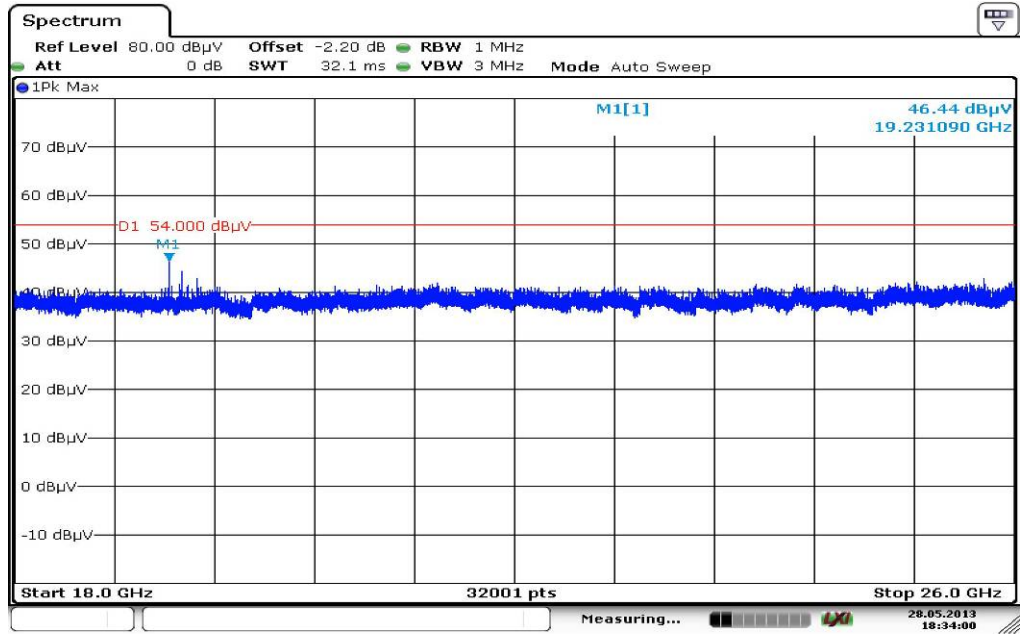


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 3: 12.75 GHz to 18 GHz, TX mode, channel 00, vertical & horizontal polarization



Plot 4: 18 GHz to 26 GHz, TX mode, channel 00, vertical & horizontal polarization



Date: 28.MAY.2013 18:34:00

Plot 5: 30 MHz to 1 GHz, TX mode, channel 39, vertical & horizontal polarization

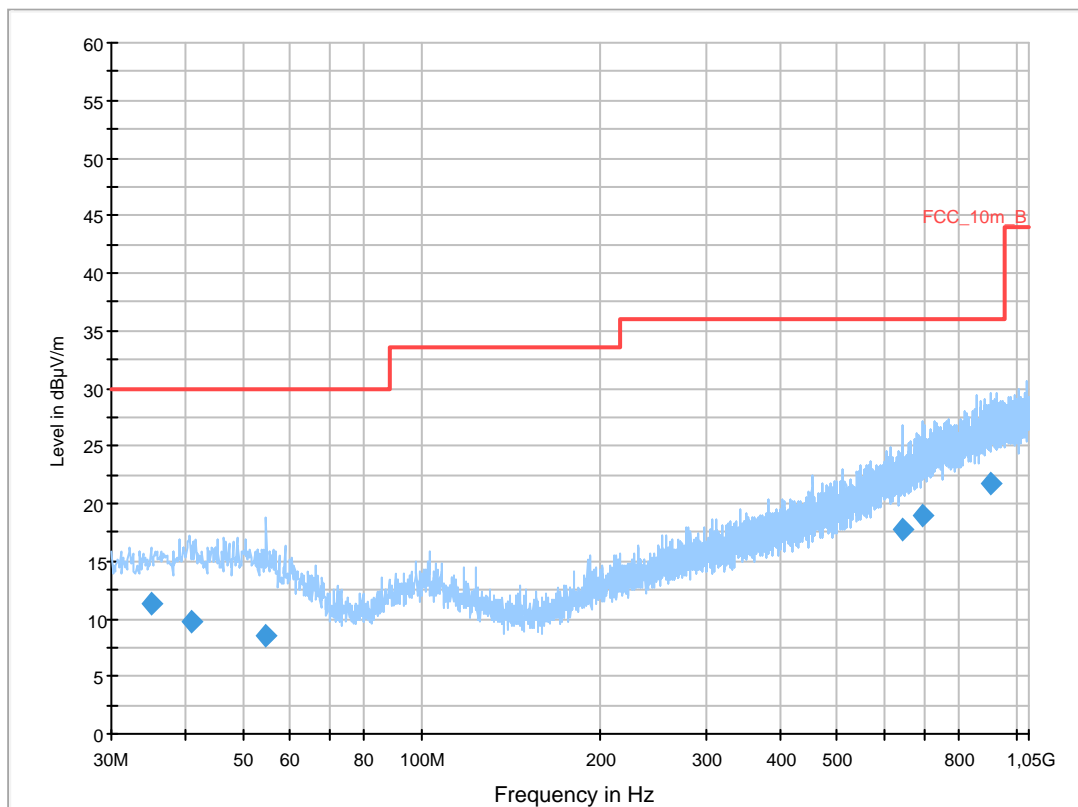
Common Information

EUT: RFU81UW
 Serial Number: IMEI: 004401.13.955833.8
 Test Description: FCC part 15 C class B @ 10 m
 Operating Conditions: BT TX Ch. 39 (DH5)
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

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

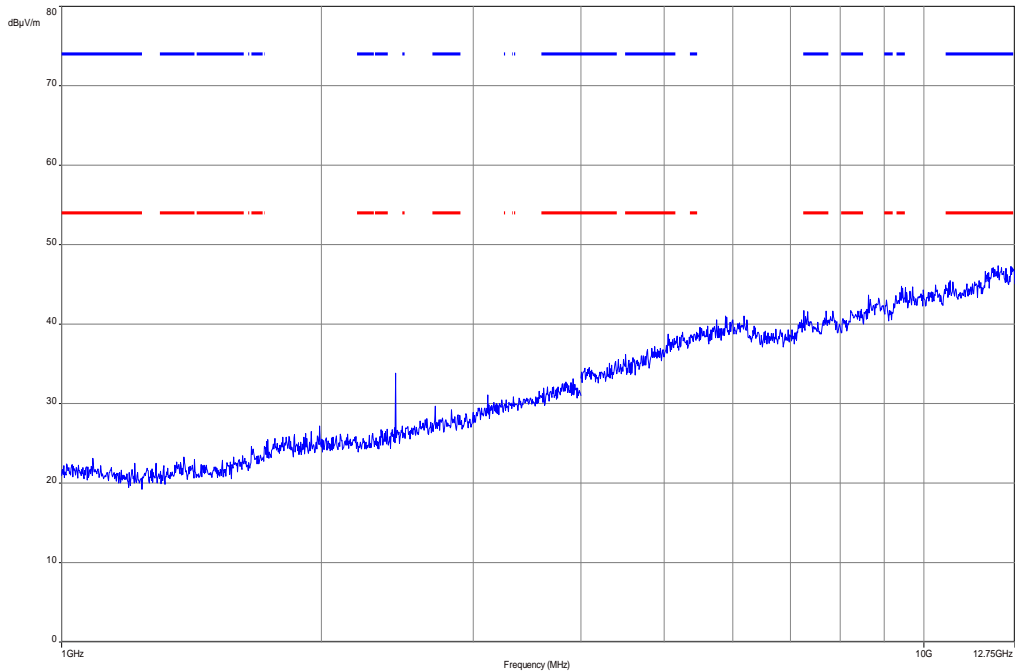
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



Final Result 1

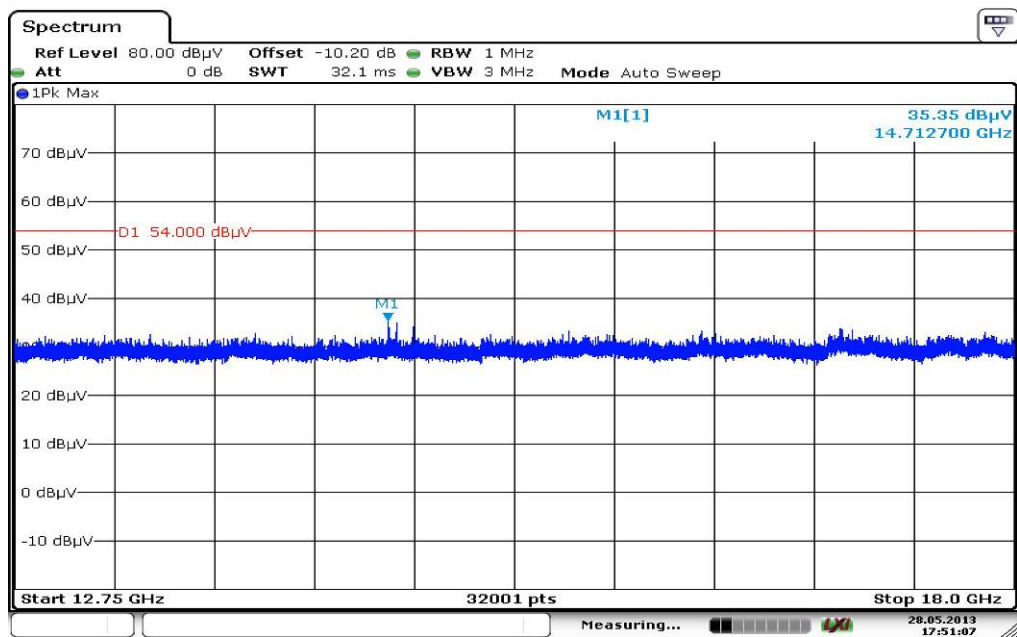
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.047350	11.3	1000.0	120.000	145.0	V	10.0	13.0	18.7	30.0	
41.077050	9.8	1000.0	120.000	162.0	H	266.0	13.4	20.2	30.0	
54.331650	8.6	1000.0	120.000	105.0	V	260.0	12.9	21.4	30.0	
645.935550	17.7	1000.0	120.000	121.0	V	280.0	21.1	18.3	36.0	
696.775200	19.0	1000.0	120.000	170.0	V	190.0	22.4	17.0	36.0	
907.694100	21.8	1000.0	120.000	170.0	H	10.0	25.2	14.2	36.0	

Plot 6: 1 GHz to 12.75 GHz, TX mode, channel 39, vertical & horizontal polarization



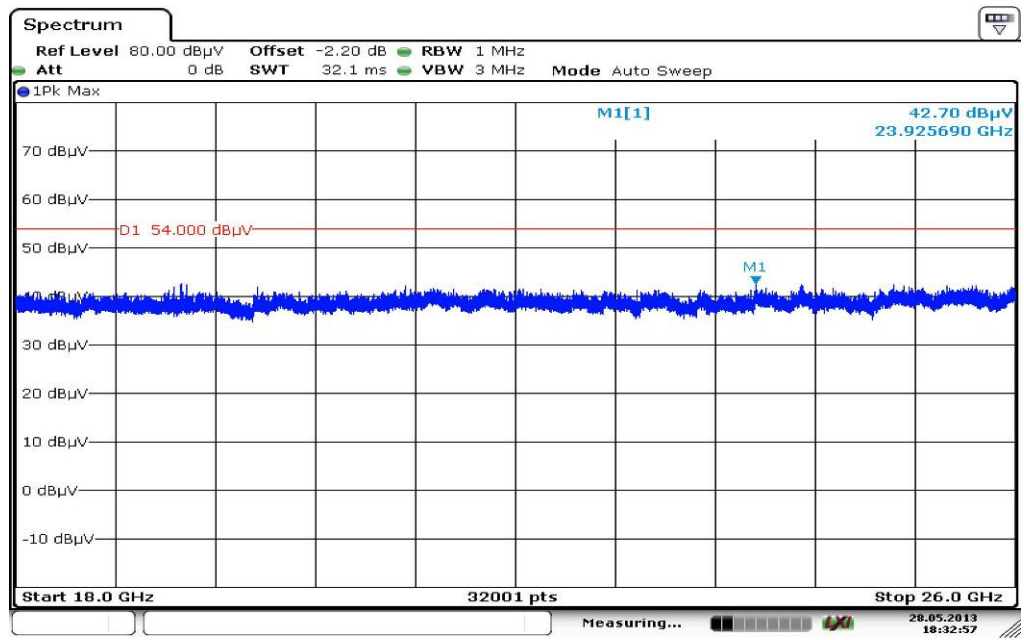
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 7: 12.75 GHz to 18 GHz, TX mode, channel 39, vertical & horizontal polarization



Date: 28.MAY.2013 17:51:08

Plot 8: 18 GHz to 26 GHz, TX mode, channel 39, vertical & horizontal polarization



Date: 28.MAY.2013 18:32:58

Plot 9: 30 MHz to 1 GHz, TX mode, channel 78, vertical & horizontal polarization

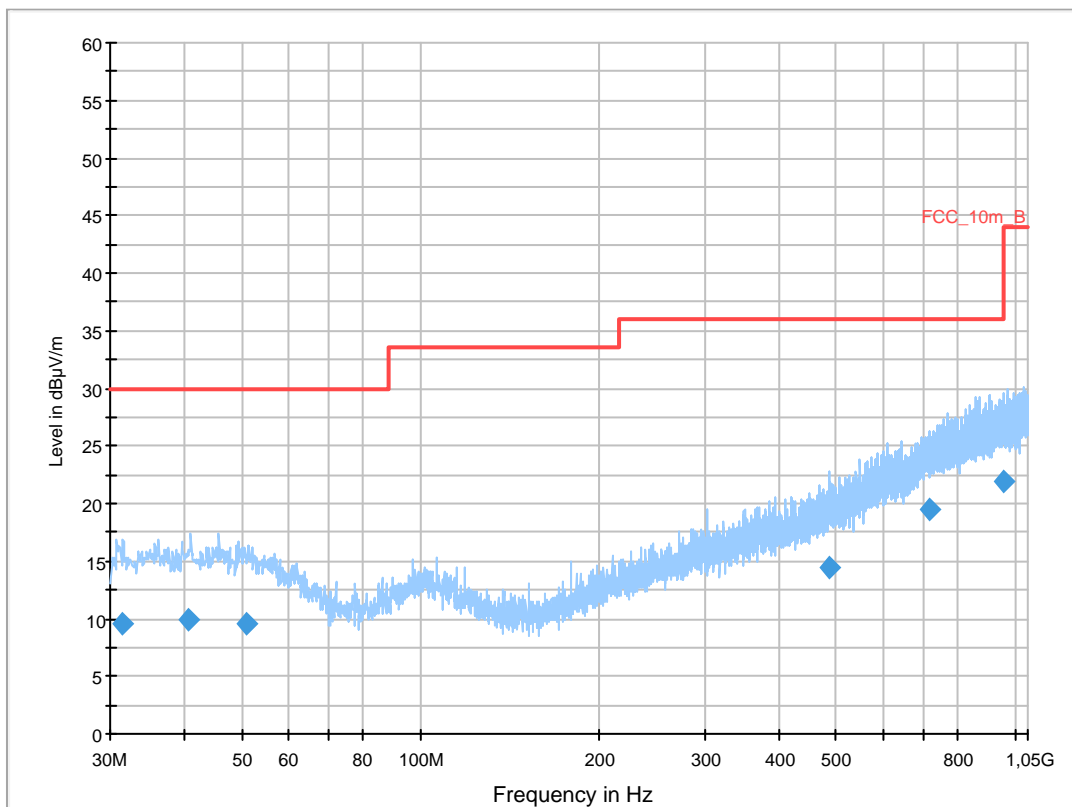
Common Information

EUT: RFU81UW
 Serial Number: IMEI: 004401.13.955833.8
 Test Description: FCC part 15 C class B @ 10 m
 Operating Conditions: BT TX Ch. 78 (DH5)
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

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

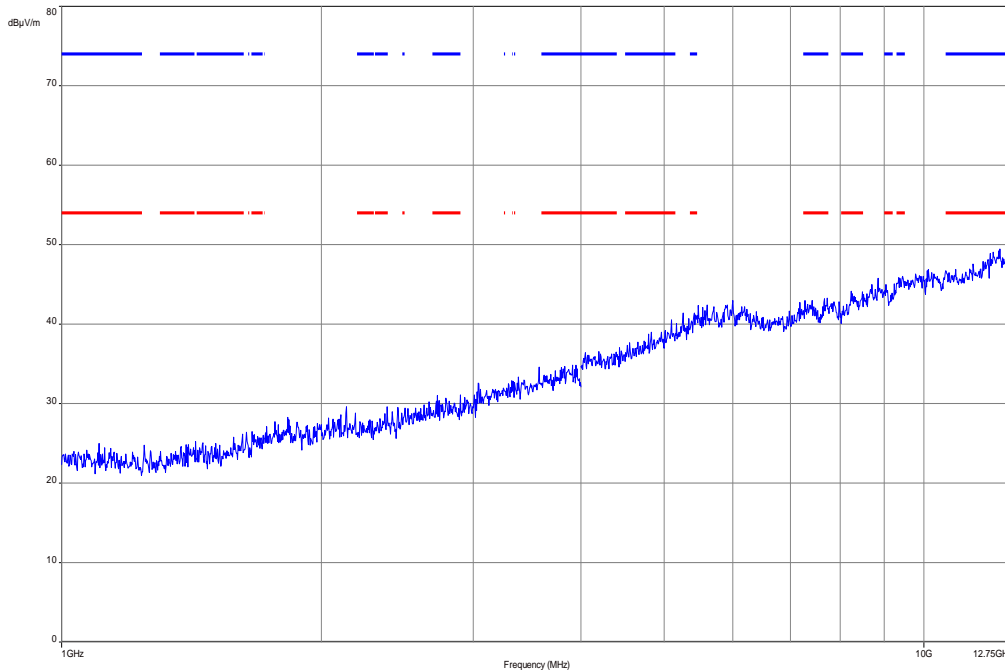
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



Final Result 1

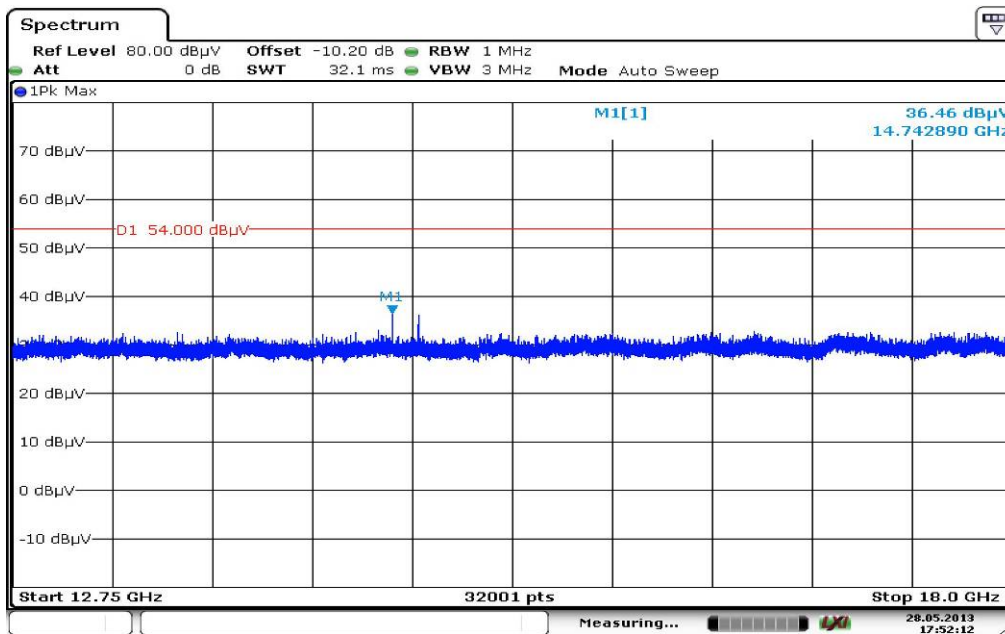
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
31.441350	9.5	1000.0	120.000	98.0	V	-2.0	12.7	20.5	30.0	
40.742700	9.9	1000.0	120.000	112.0	H	180.0	13.4	20.1	30.0	
50.692650	9.6	1000.0	120.000	170.0	H	10.0	13.3	20.4	30.0	
488.323050	14.5	1000.0	120.000	170.0	V	265.0	18.5	21.5	36.0	
716.833350	19.5	1000.0	120.000	155.0	H	190.0	22.9	16.5	36.0	
960.229650	22.0	1000.0	120.000	148.0	H	273.0	25.4	22.0	44.0	

Plot 10: 1 GHz to 12.75 GHz, TX mode, channel 78, vertical & horizontal polarization

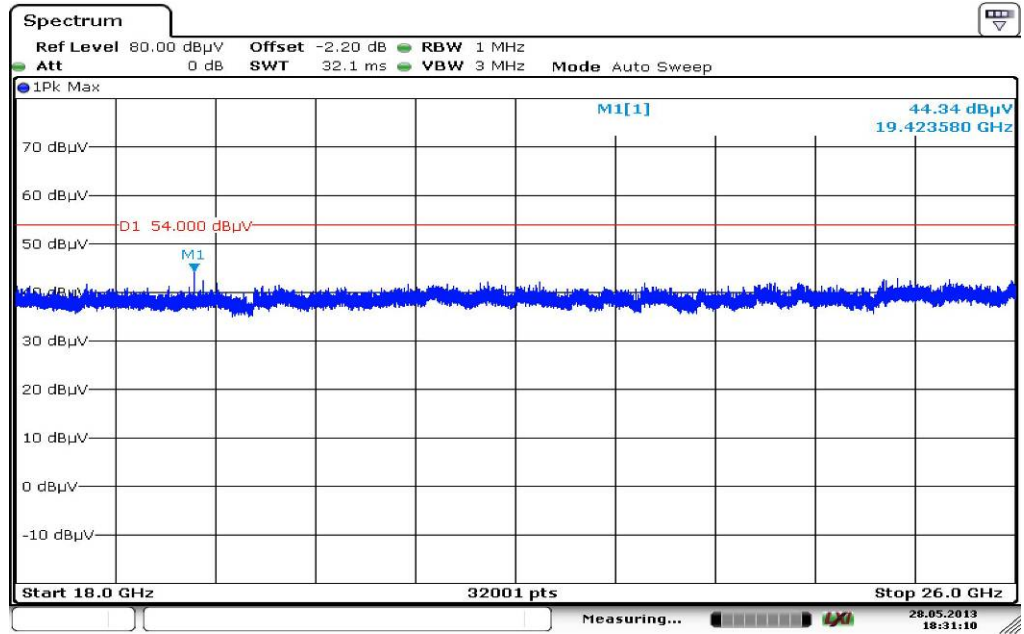


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 11: 12.75 GHz to 18 GHz, TX mode, channel 78, vertical & horizontal polarization



Plot 12: 18 GHz to 26 GHz, TX mode, channel 78, vertical & horizontal polarization



Date: 28.MAY.2013 18:31:10

Plots: Pi/4 DQPSK

Plot 1: 30 MHz to 1 GHz, TX mode, channel 00, vertical & horizontal polarization

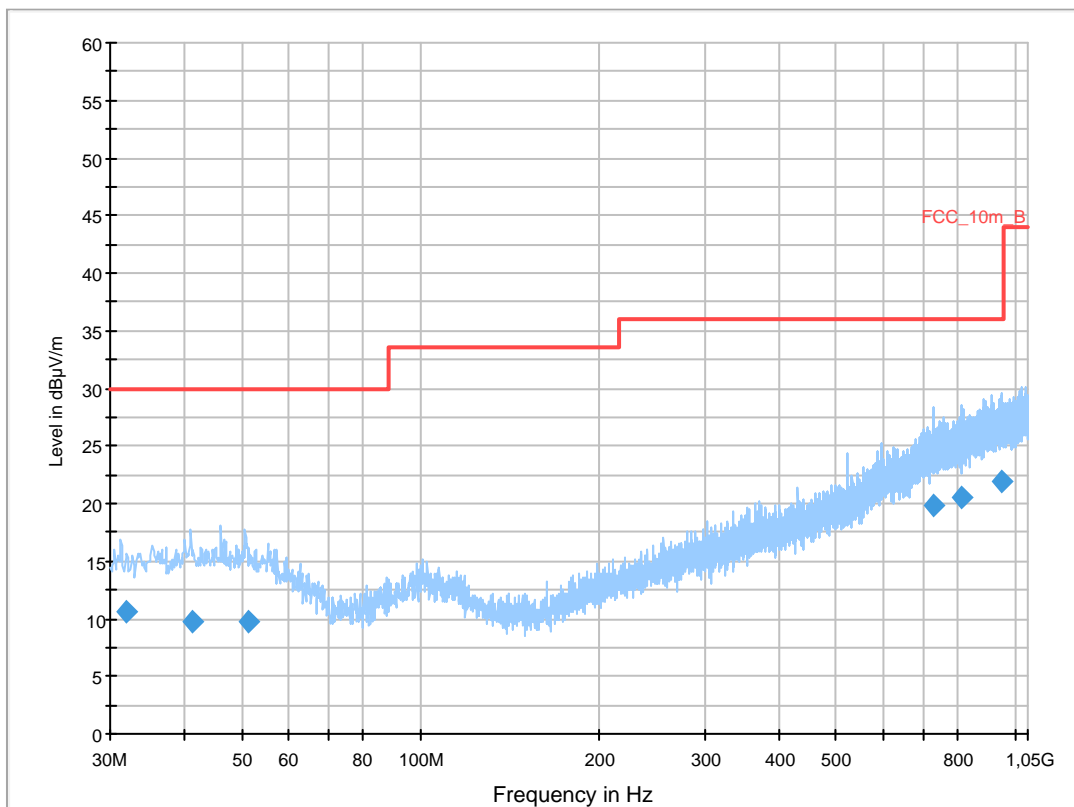
Common Information

EUT: RFU81UW
 Serial Number: IMEI: 004401.13.955833.8
 Test Description: FCC part 15 C class B @ 10 m
 Operating Conditions: BT TX Ch. 0 (2DH5)
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

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

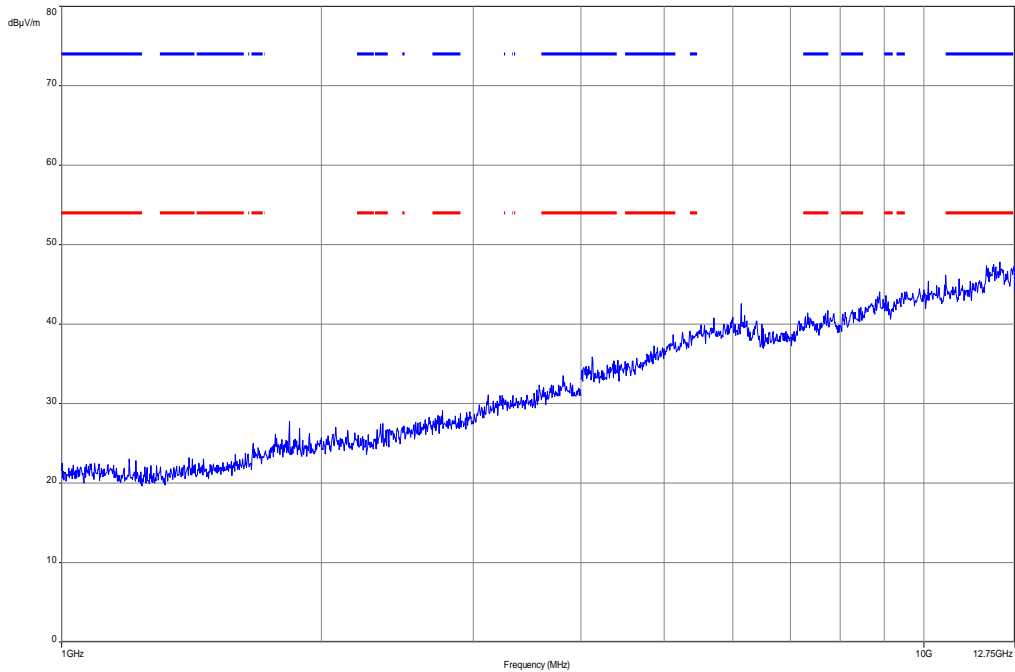
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



Final Result 1

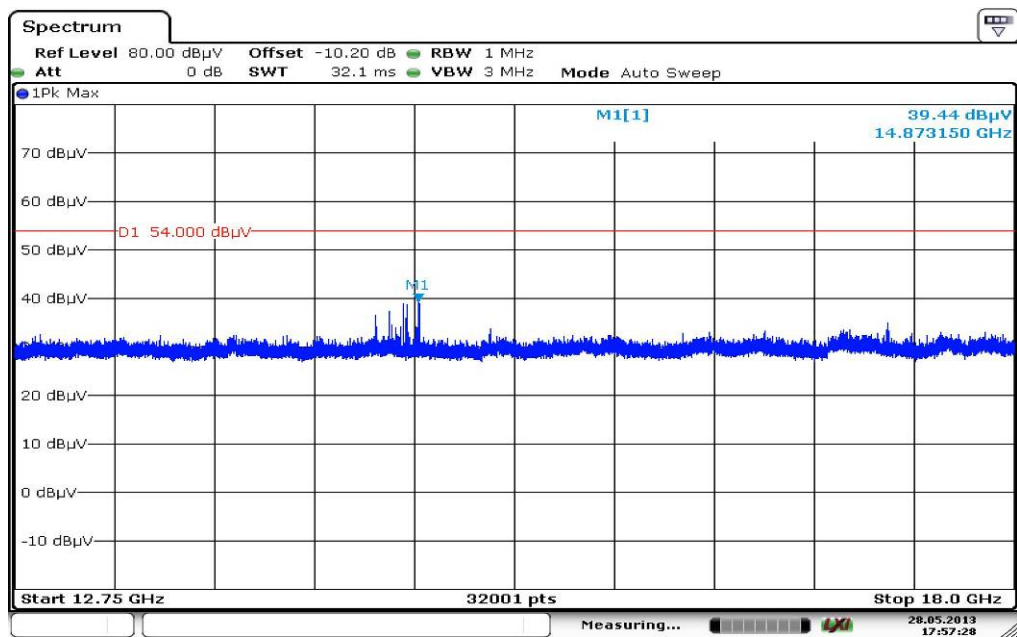
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
31.826850	10.5	1000.0	120.000	105.0	V	-2.0	12.7	19.5	30.0	
41.101650	9.8	1000.0	120.000	154.0	H	180.0	13.4	20.2	30.0	
51.250800	9.7	1000.0	120.000	170.0	H	10.0	13.2	20.3	30.0	
729.273600	19.8	1000.0	120.000	170.0	H	100.0	23.2	16.2	36.0	
812.627250	20.5	1000.0	120.000	106.0	V	100.0	24.0	15.5	36.0	
949.344750	21.9	1000.0	120.000	170.0	H	10.0	25.3	14.1	36.0	

Plot 2: 1 GHz to 12.75 GHz, TX mode, channel 00, vertical & horizontal polarization

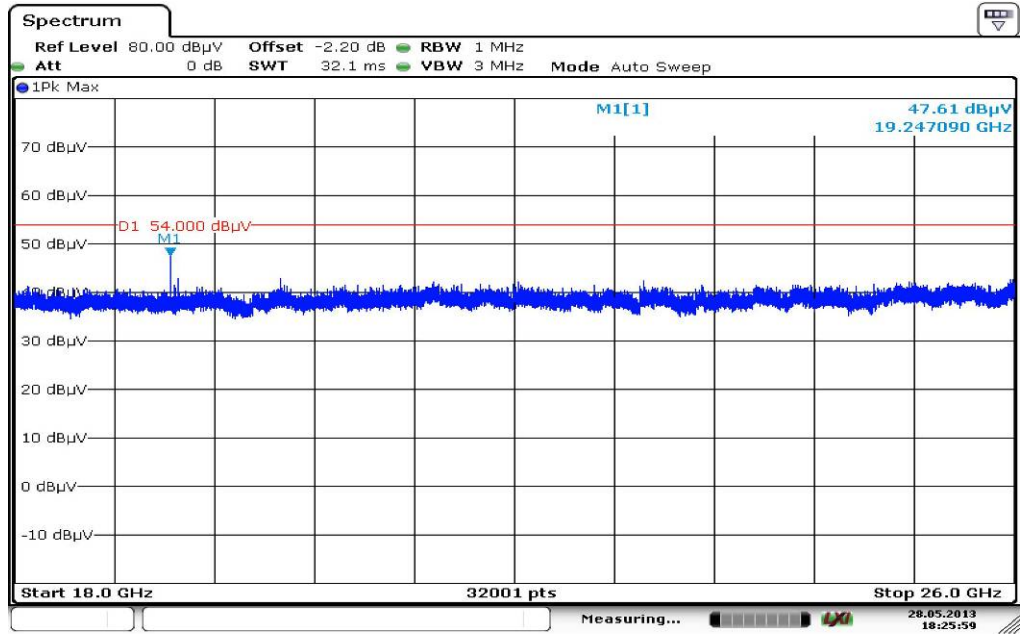


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 3: 12.75 GHz to 18 GHz, TX mode, channel 00, vertical & horizontal polarization



Plot 4: 18 GHz to 26 GHz, TX mode, channel 00, vertical & horizontal polarization



Date: 28.MAY.2013 18:26:00

Plot 5: 30 MHz to 1 GHz, TX mode, channel 39, vertical & horizontal polarization

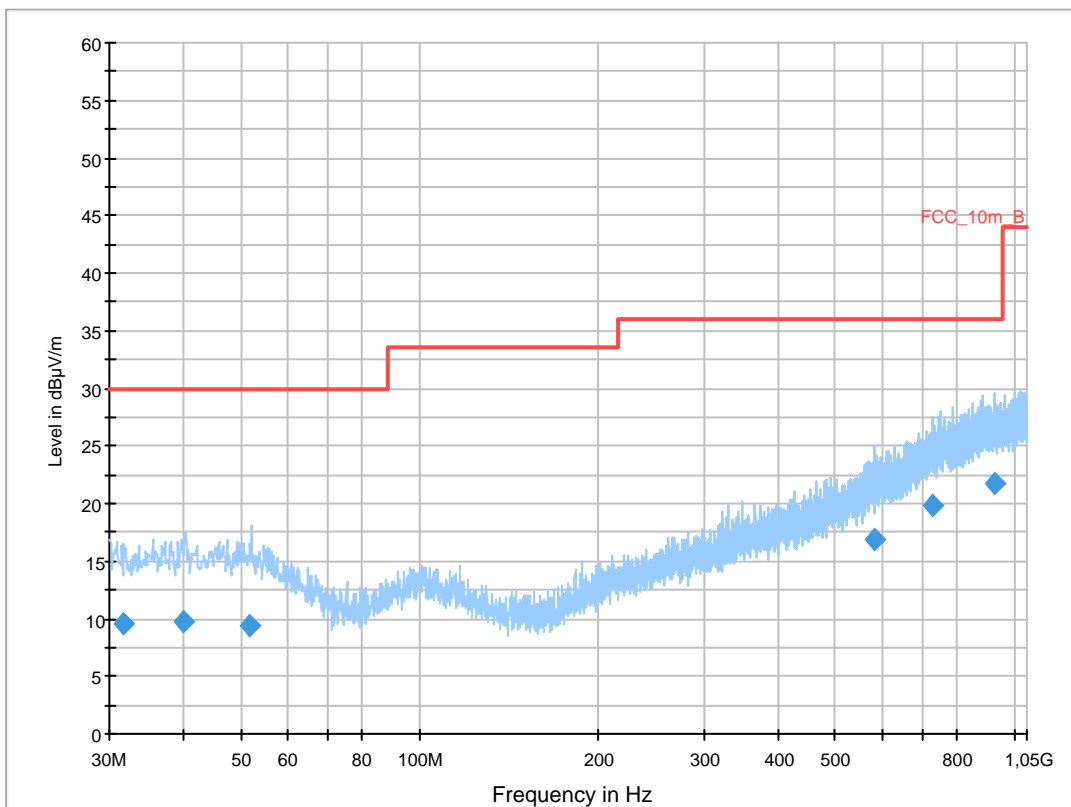
Common Information

EUT: RFU81UW
 Serial Number: IMEI: 004401.13.955833.8
 Test Description: FCC part 15 C class B @ 10 m
 Operating Conditions: BT TX Ch. 39 (2DH5)
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

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

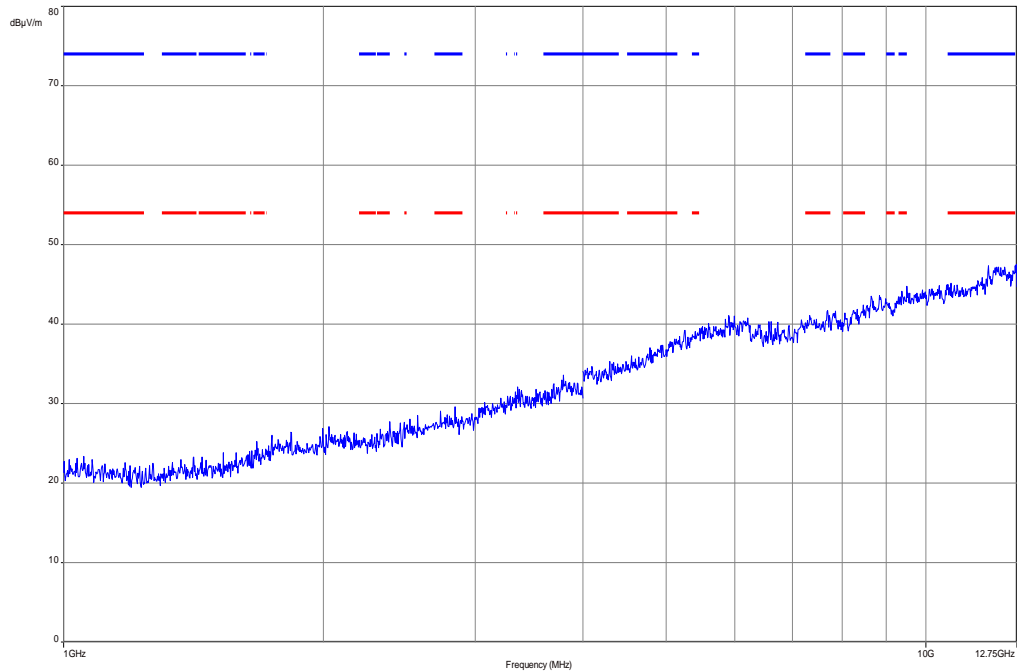
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



Final Result 1

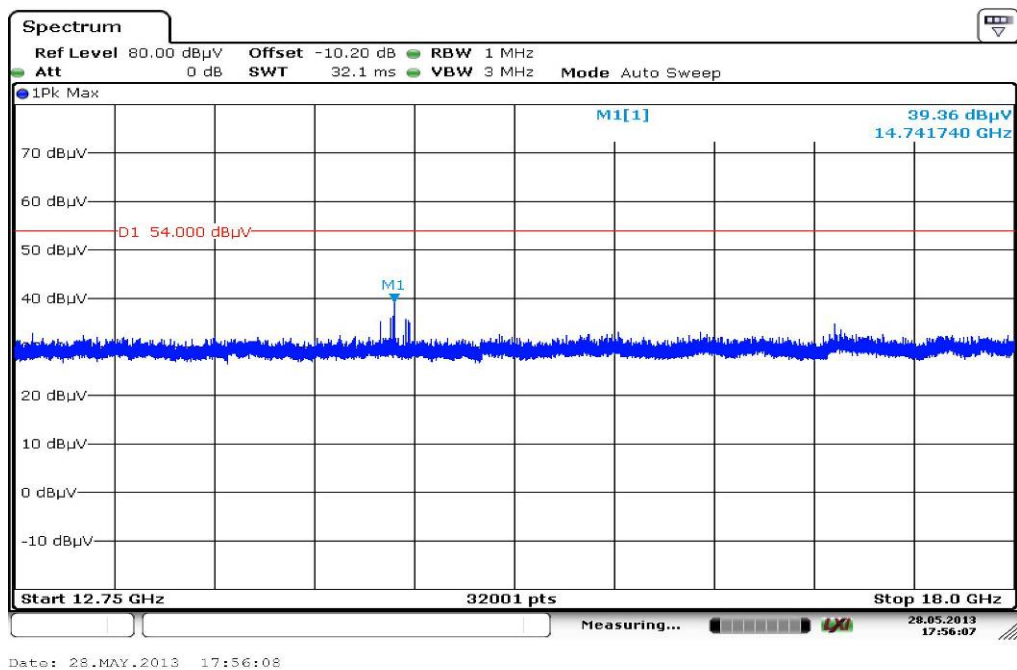
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
31.696050	9.5	1000.0	120.000	170.0	V	92.0	12.7	20.5	30.0	
40.059450	9.8	1000.0	120.000	170.0	H	-10.0	13.4	20.2	30.0	
51.855900	9.4	1000.0	120.000	145.0	H	10.0	13.2	20.6	30.0	
580.205850	16.9	1000.0	120.000	170.0	V	100.0	20.2	19.1	36.0	
731.347650	19.8	1000.0	120.000	170.0	V	85.0	23.2	16.2	36.0	
927.671100	21.8	1000.0	120.000	170.0	V	-10.0	25.3	14.2	36.0	

Plot 6: 1 GHz to 12.75 GHz, TX mode, channel 39, vertical & horizontal polarization

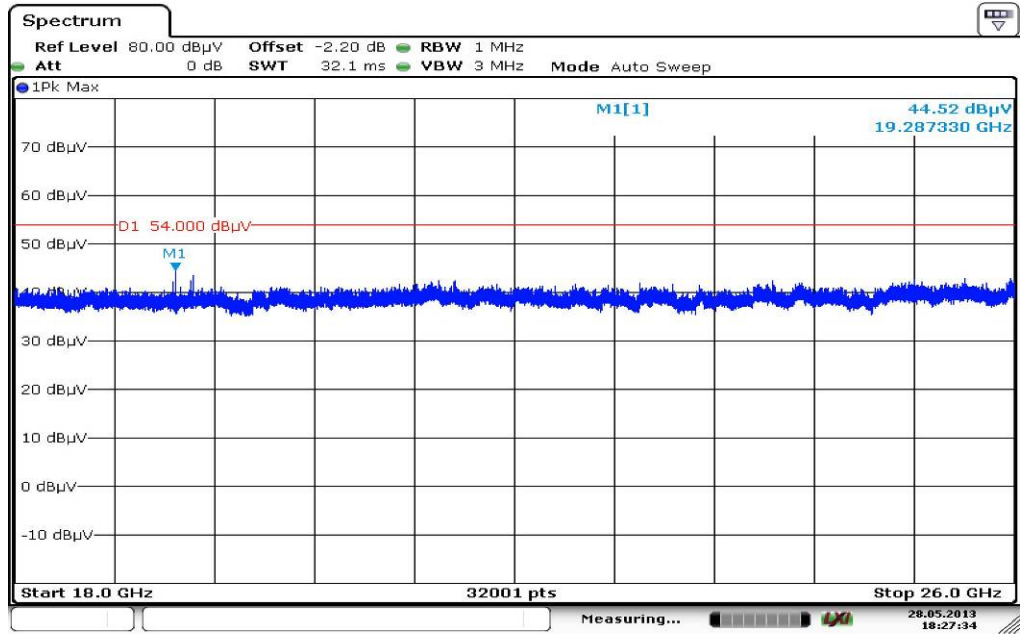


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 7: 12.75 GHz to 18 GHz, TX mode, channel 39, vertical & horizontal polarization



Plot 8: 18 GHz to 26 GHz, TX mode, channel 39, vertical & horizontal polarization



Date: 28.MAY.2013 18:27:35

Plot 9: 30 MHz to 1 GHz, TX mode, channel 78, vertical & horizontal polarization

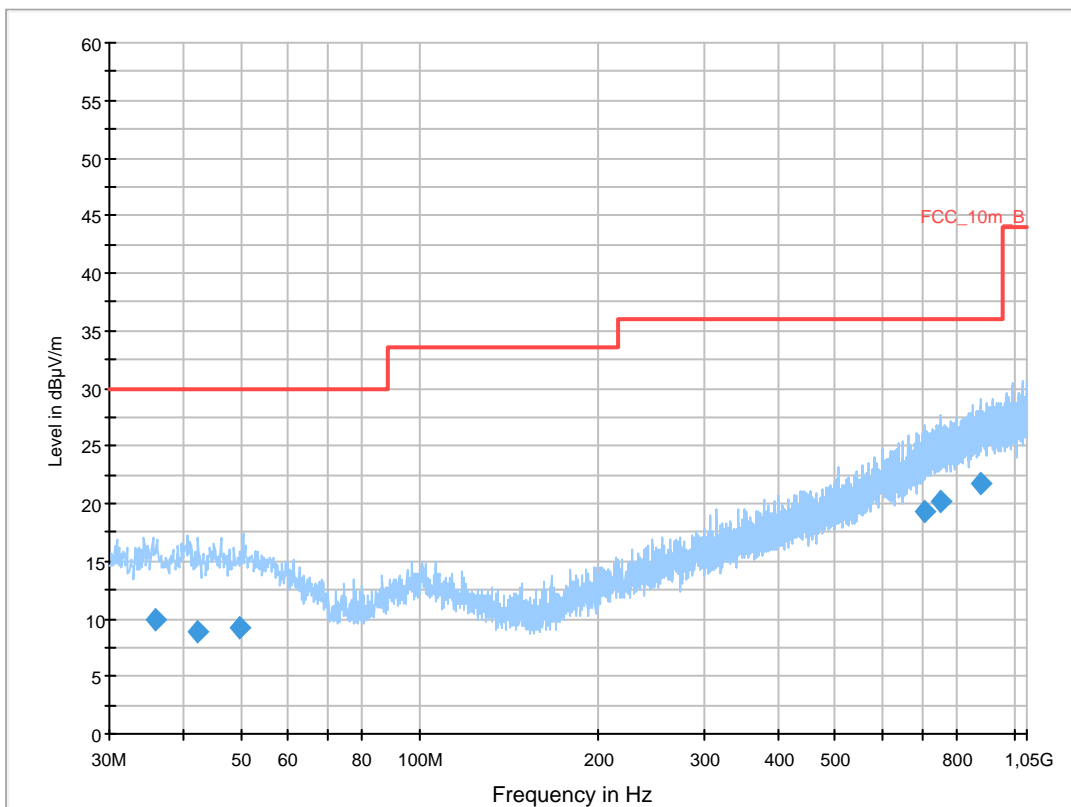
Common Information

EUT: RFU81UW
 Serial Number: IMEI: 004401.13.955833.8
 Test Description: FCC part 15 C class B @ 10 m
 Operating Conditions: BT TX Ch. 78 (2DH5)
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

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

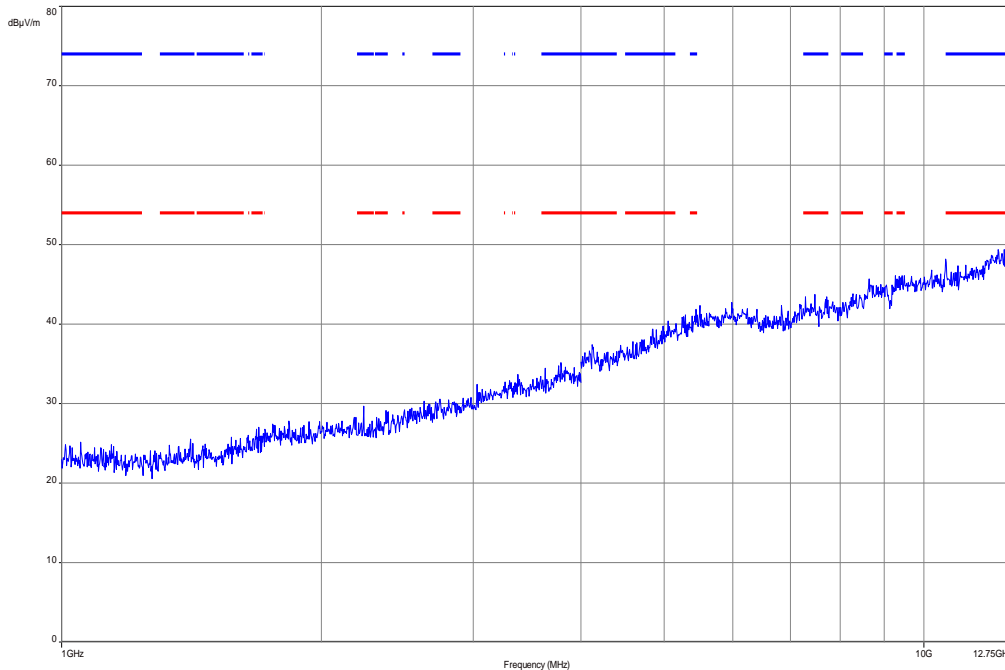
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



Final Result 1

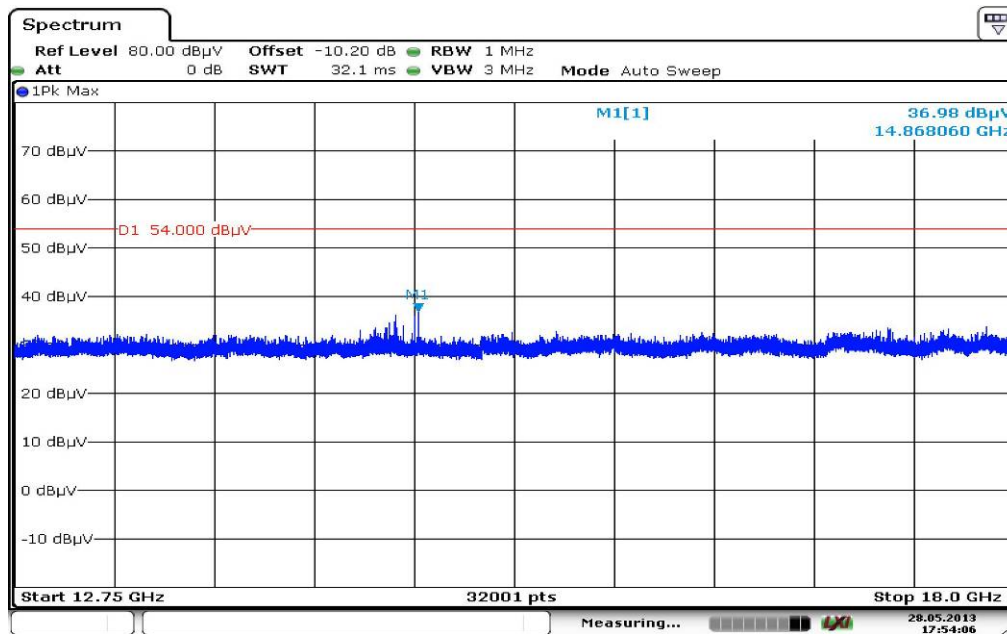
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.909400	9.9	1000.0	120.000	170.0	V	180.0	13.1	20.1	30.0	
42.320850	8.8	1000.0	120.000	170.0	H	268.0	13.4	21.2	30.0	
49.682400	9.2	1000.0	120.000	170.0	H	280.0	13.4	20.8	30.0	
709.006050	19.3	1000.0	120.000	145.0	V	280.0	22.7	16.7	36.0	
750.987300	20.2	1000.0	120.000	170.0	V	-3.0	23.7	15.8	36.0	
879.276450	21.7	1000.0	120.000	170.0	V	175.0	24.9	14.3	36.0	

Plot 10: 1 GHz to 12.75 GHz, TX mode, channel 78, vertical & horizontal polarization



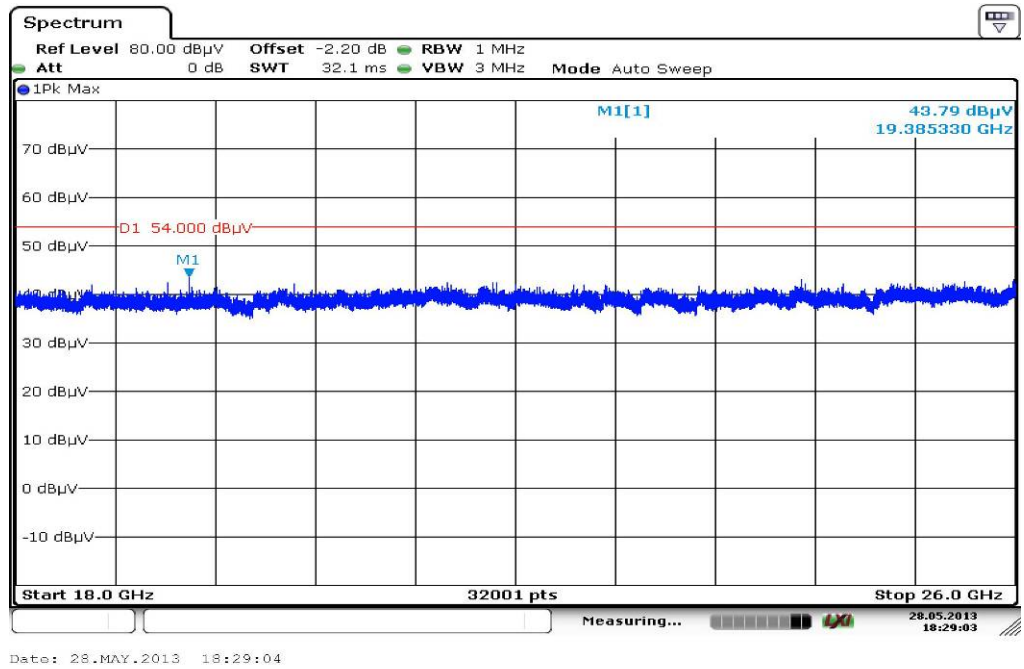
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 11: 12.75 GHz to 18 GHz, TX mode, channel 78, vertical & horizontal polarization



Date: 28.MAY.2013 17:54:06

Plot 12: 18 GHz to 26 GHz, TX mode, channel 78, vertical & horizontal polarization



Plots: 8 DPSK

Plot 1: 30 MHz to 1 GHz, TX mode, channel 00, vertical & horizontal polarization

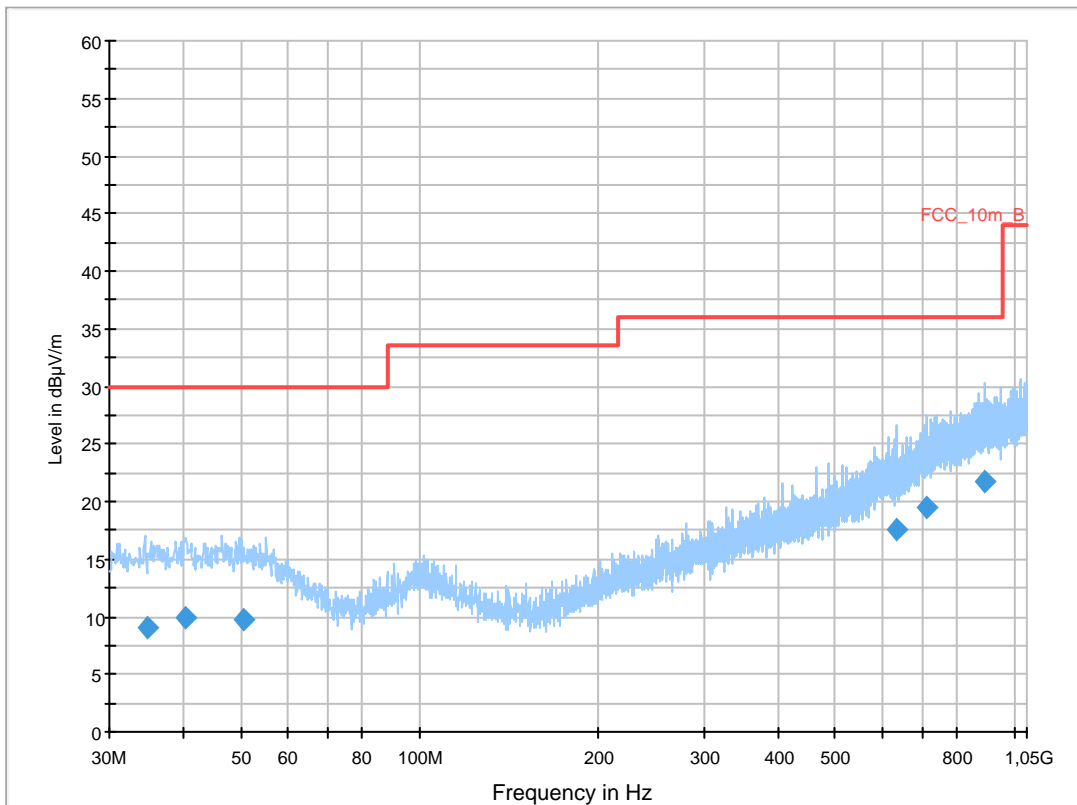
Common Information

EUT: RFU81UW
 Serial Number: IMEI: 004401.13.955833.8
 Test Description: FCC part 15 C class B @ 10 m
 Operating Conditions: BT TX Ch. 0 (3DH5)
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

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

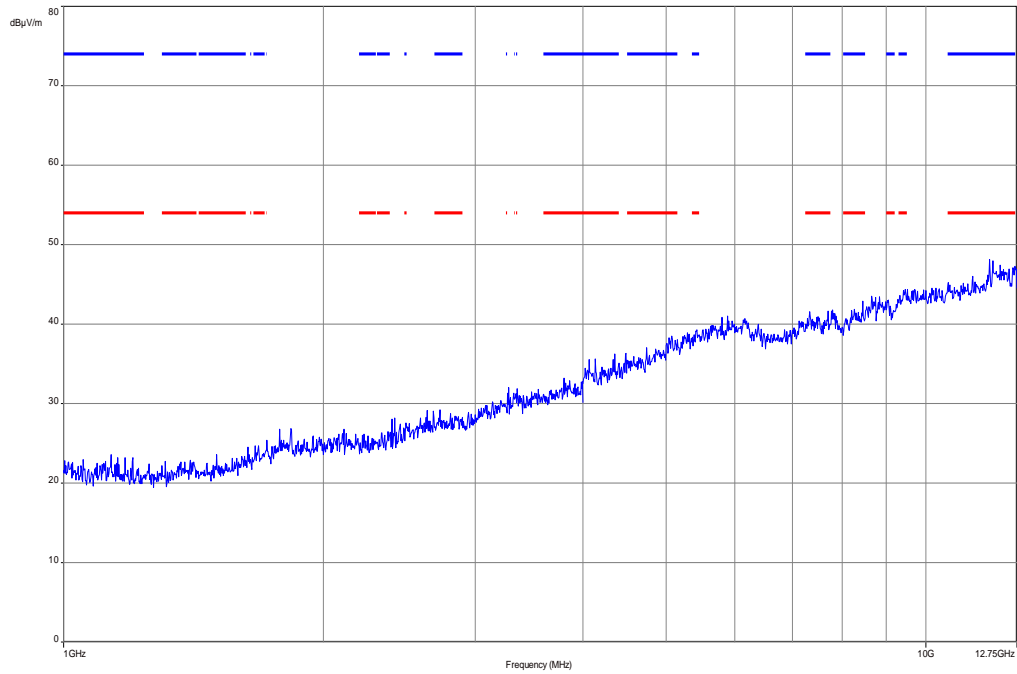
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



Final Result 1

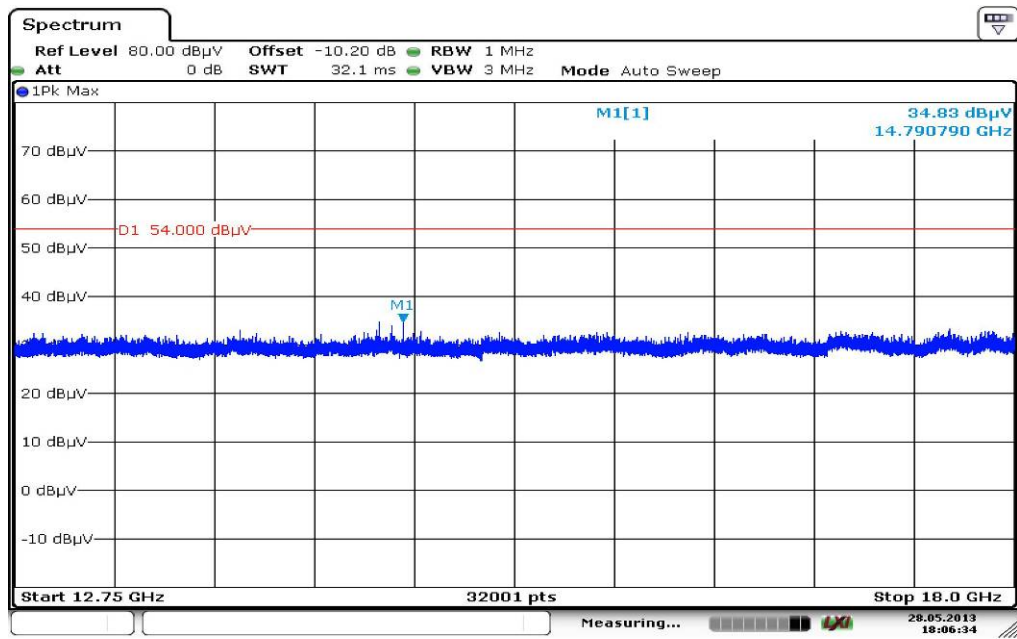
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
34.699350	9.0	1000.0	120.000	120.0	H	170.0	13.0	21.0	30.0	
40.385700	10.0	1000.0	120.000	170.0	V	-5.0	13.4	20.0	30.0	
50.474700	9.7	1000.0	120.000	111.0	V	10.0	13.3	20.3	30.0	
632.379900	17.6	1000.0	120.000	170.0	V	10.0	21.0	18.4	36.0	
711.953700	19.5	1000.0	120.000	170.0	V	100.0	22.8	16.5	36.0	
893.346600	21.7	1000.0	120.000	170.0	H	10.0	25.1	14.3	36.0	

Plot 2: 1 GHz to 12.75 GHz, TX mode, channel 00, vertical & horizontal polarization

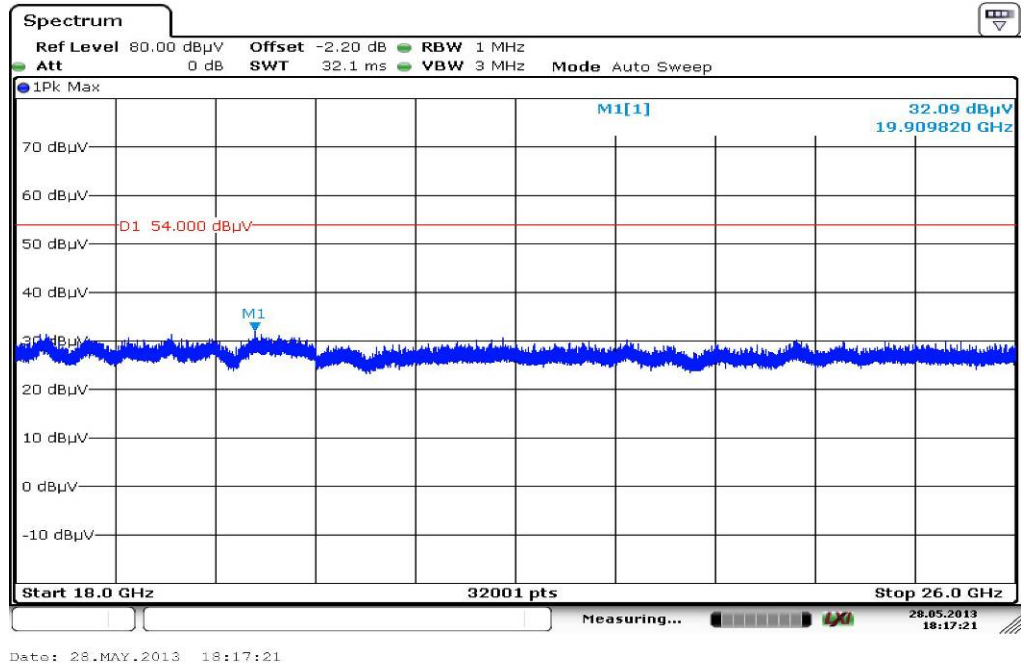


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 3: 12.75 GHz to 18 GHz, TX mode, channel 00, vertical & horizontal polarization



Plot 4: 18 GHz to 26 GHz, TX mode, channel 00, vertical & horizontal polarization



Plot 5: 30 MHz to 1 GHz, TX mode, channel 39, vertical & horizontal polarization

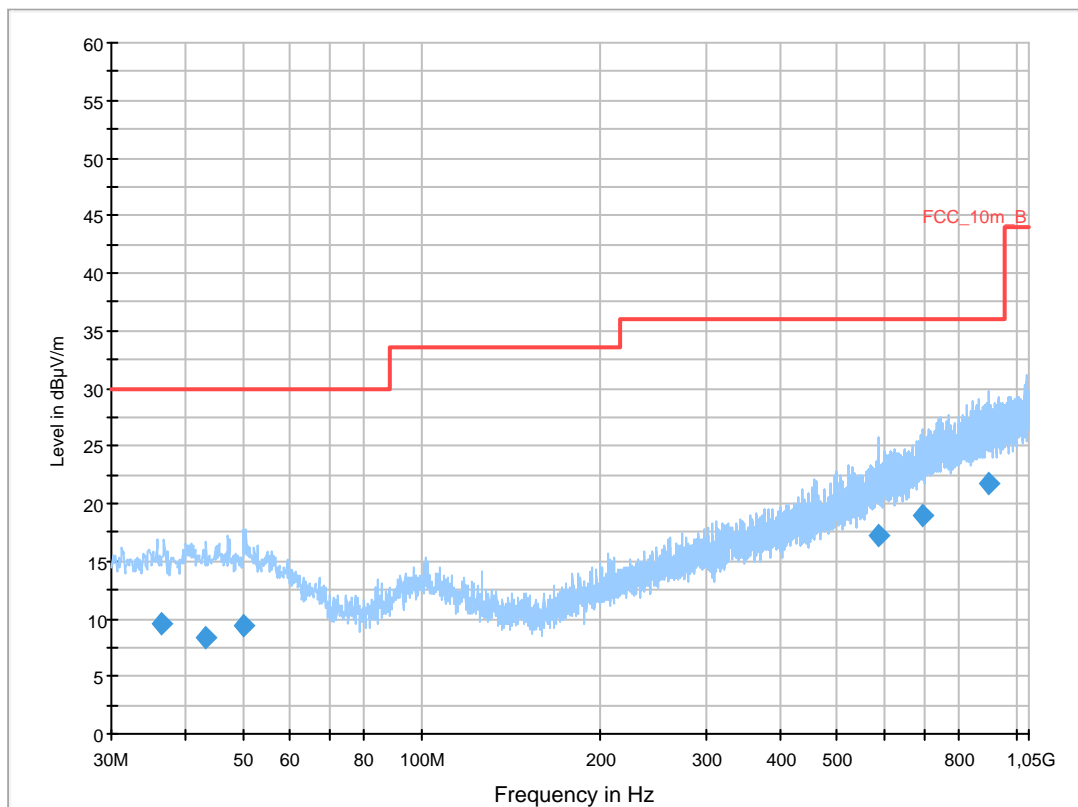
Common Information

EUT: RFU81UW
 Serial Number: IMEI: 004401.13.955833.8
 Test Description: FCC part 15 C class B @ 10 m
 Operating Conditions: BT TX Ch. 39 (3DH5)
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

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

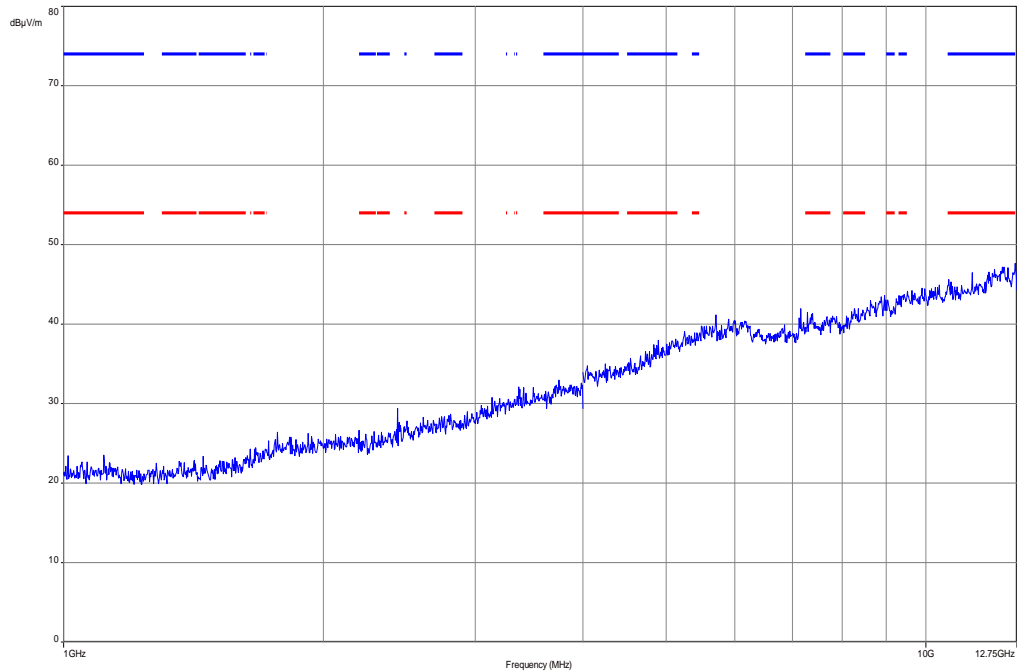
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



Final Result 1

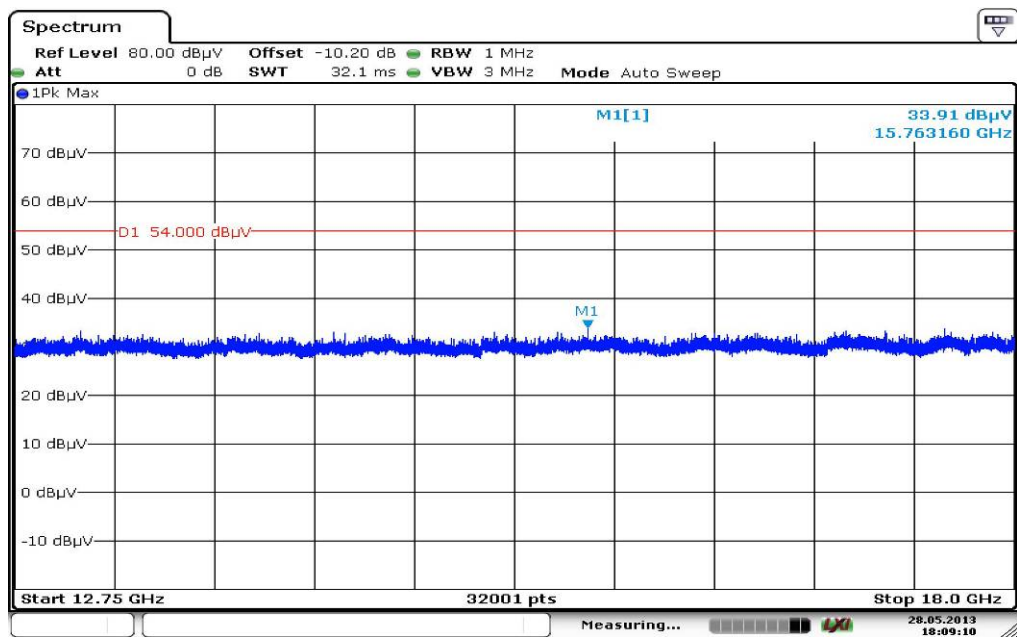
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
36.382200	9.6	1000.0	120.000	143.0	H	190.0	13.1	20.4	30.0	
43.175700	8.4	1000.0	120.000	98.0	H	261.0	13.3	21.6	30.0	
49.941000	9.4	1000.0	120.000	170.0	V	85.0	13.4	20.6	30.0	
588.699900	17.2	1000.0	120.000	121.0	H	260.0	20.5	18.8	36.0	
696.636150	19.0	1000.0	120.000	152.0	H	280.0	22.4	17.0	36.0	
898.824750	21.7	1000.0	120.000	170.0	V	280.0	25.2	14.3	36.0	

Plot 6: 1 GHz to 12.75 GHz, TX mode, channel 39, vertical & horizontal polarization



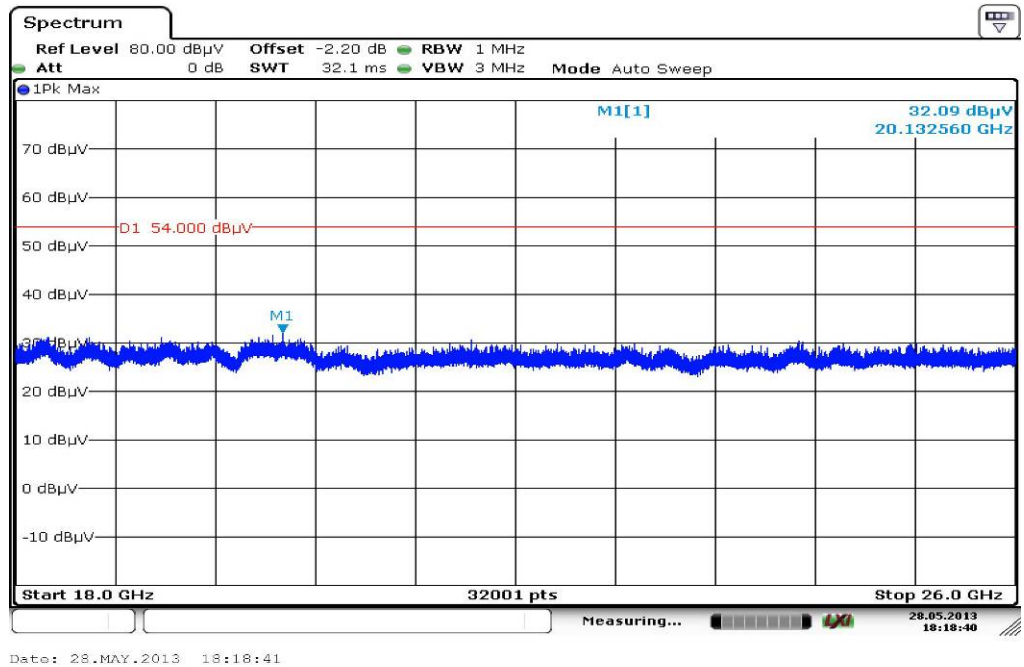
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 7: 12.75 GHz to 18 GHz, TX mode, channel 39, vertical & horizontal polarization



Date: 28.MAY.2013 18:09:11

Plot 8: 18 GHz to 26 GHz, TX mode, channel 39, vertical & horizontal polarization



Plot 9: 30 MHz to 1 GHz, TX mode, channel 78, vertical & horizontal polarization

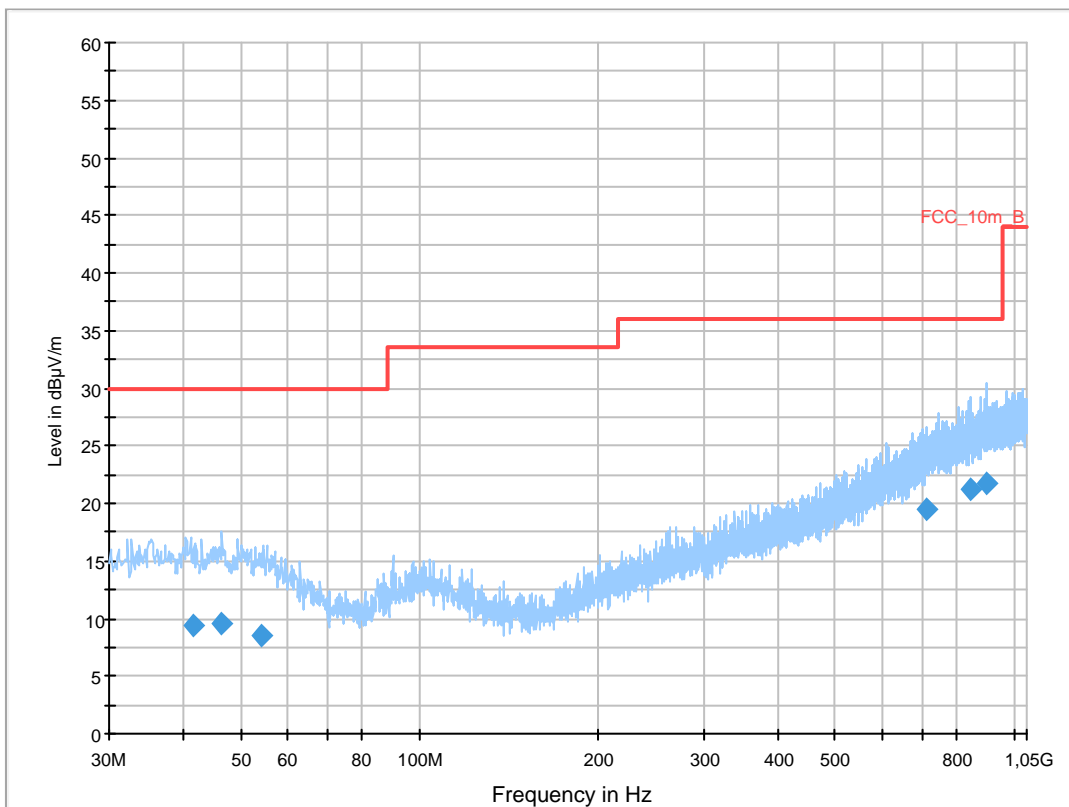
Common Information

EUT: RFU81UW
 Serial Number: IMEI: 004401.13.955833.8
 Test Description: FCC part 15 C class B @ 10 m
 Operating Conditions: BT TX Ch. 78 (3DH5)
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

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

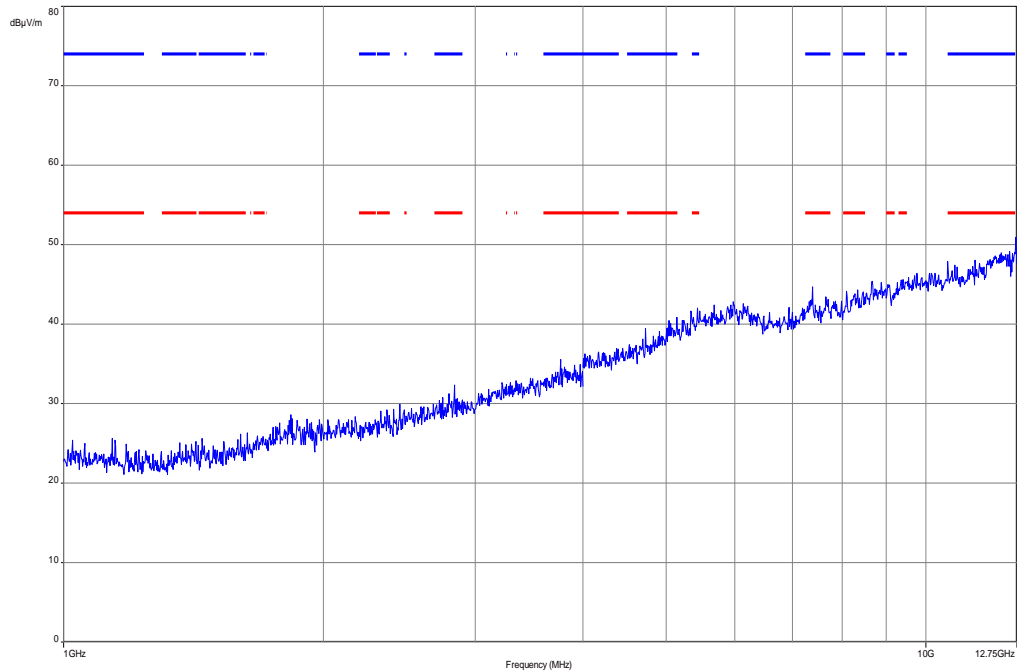
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



Final Result 1

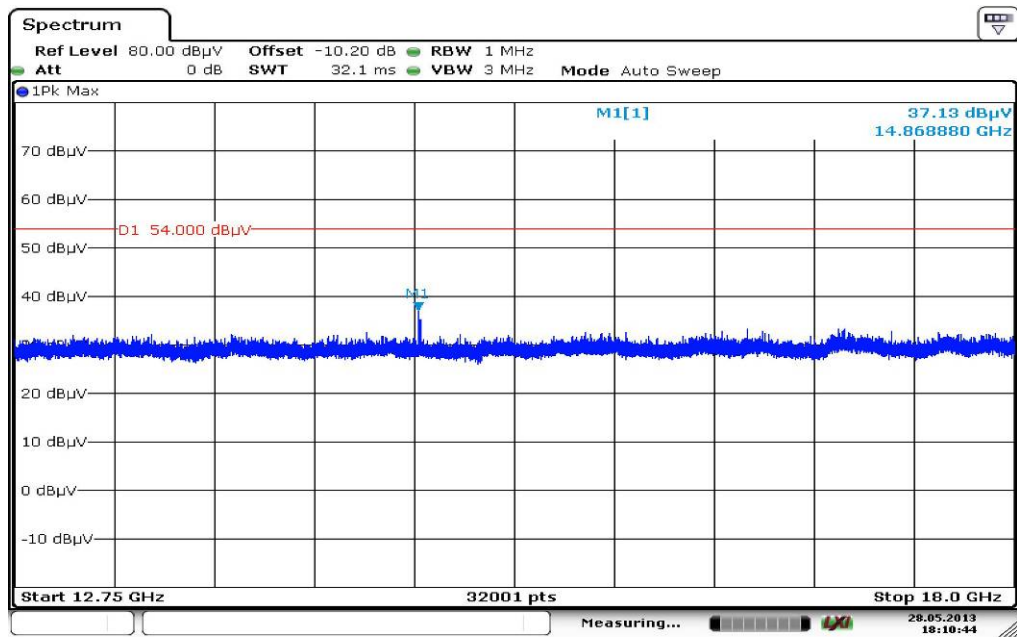
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
41.497800	9.5	1000.0	120.000	170.0	H	180.0	13.4	20.5	30.0	
46.491450	9.6	1000.0	120.000	153.0	V	88.0	13.3	20.4	30.0	
54.195600	8.6	1000.0	120.000	104.0	V	182.0	13.0	21.4	30.0	
711.794700	19.5	1000.0	120.000	170.0	H	190.0	22.8	16.5	36.0	
845.975100	21.2	1000.0	120.000	170.0	V	171.0	24.5	14.8	36.0	
900.506400	21.8	1000.0	120.000	98.0	H	270.0	25.2	14.2	36.0	

Plot 10: 1 GHz to 12.75 GHz, TX mode, channel 78, vertical & horizontal polarization

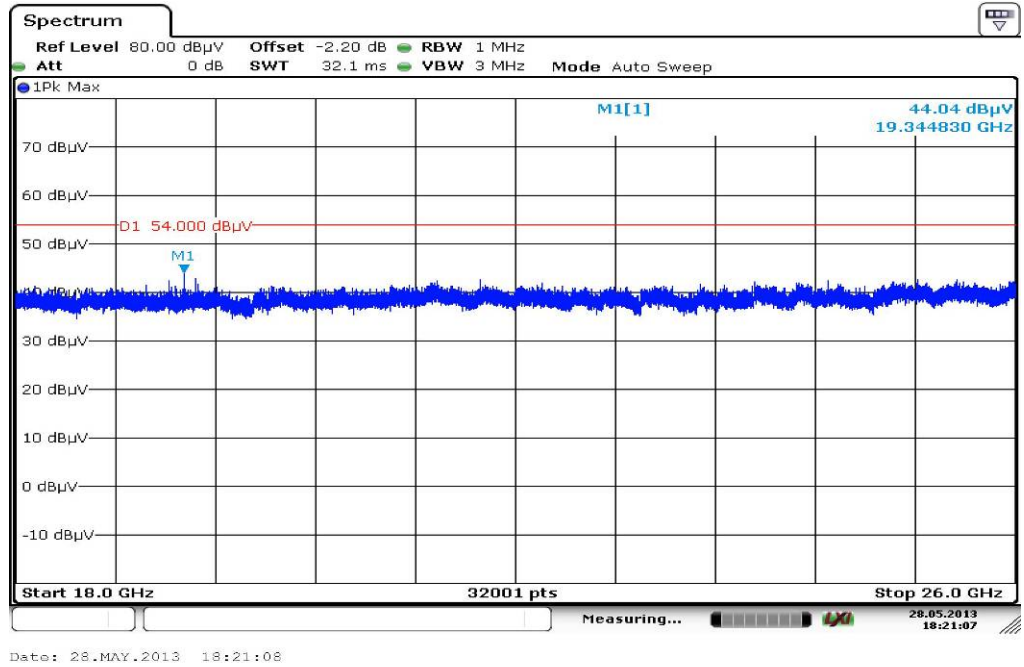


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 11: 12.75 GHz to 18 GHz, TX mode, channel 78, vertical & horizontal polarization



Plot 12: 18 GHz to 26 GHz, TX mode, channel 78, vertical & horizontal polarization



10.12 RX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in idle/receive mode. The EUT is detached so all oscillators are active.

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 26 GHz
Trace-Mode:	Max Hold

Limits:

FCC		IC
RX Spurious Emissions Radiated		
Frequency (MHz)	Field strength (dB μ V/m)	Measurement distance
30 - 88	30.0	10
88 - 216	33.5	10
216 - 960	36.0	10
Above 960	54.0	3

Results:

RX spurious emissions radiated [dB μ V/m]		
F [MHz]	Detector	Level [dB μ V/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
All detected peak emissions are below the average limit.		
Measurement uncertainty	±3 dB	

Result: Passed

Plots:

Plot 1: 30 MHz to 1 GHz, RX mode, vertical & horizontal polarization

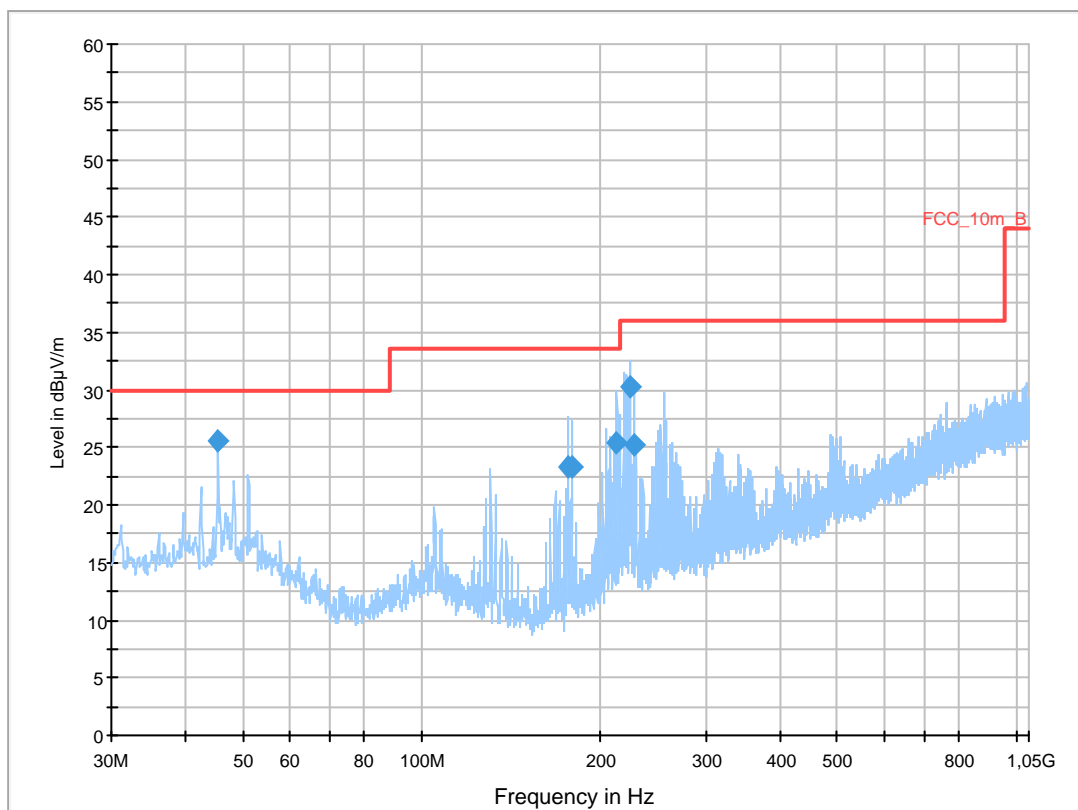
Common Information

EUT: RFU81UW
 Serial Number: imei:004402242283665
 Test Description: FCC part 15 C class B @ 10 m
 Operating Conditions: BT DH5 testmode + charging
 Operator Name: Wolsdorfer
 Comment: AC 115V / 60Hz

Scan Setup: STAN_Fin [EMI radiated]

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

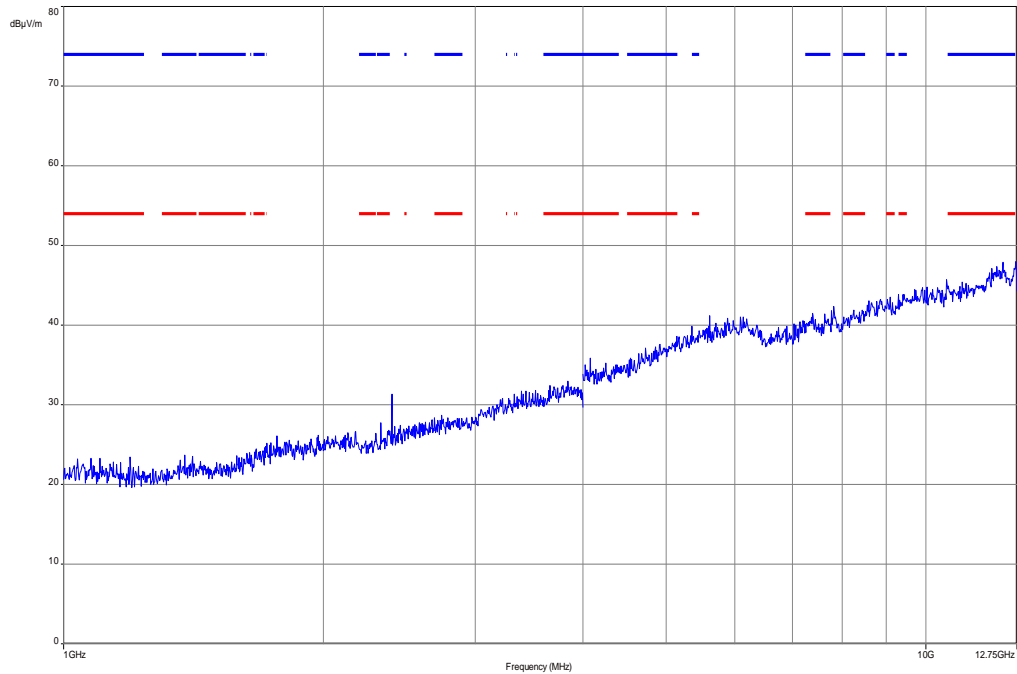
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



Final Result 1

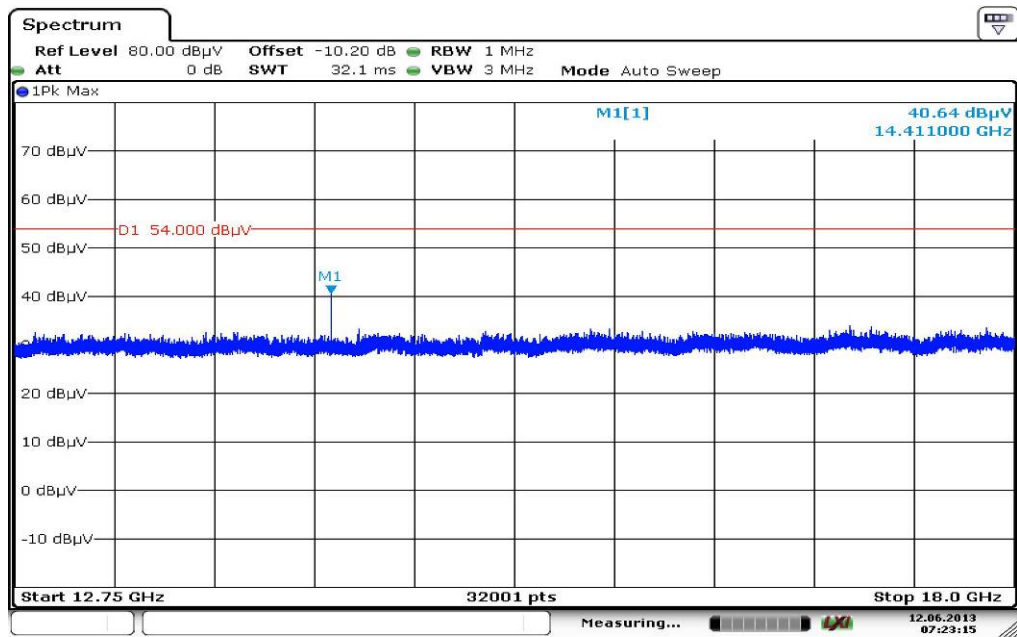
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
45.435150	25.5	1000.0	120.000	121.0	V	-9.0	13.3	4.5	30.0	
175.892400	23.2	1000.0	120.000	170.0	V	92.0	10.2	10.3	33.5	
178.744350	23.4	1000.0	120.000	104.0	V	100.0	10.4	10.1	33.5	
212.858100	25.3	1000.0	120.000	121.0	V	0.0	12.1	8.2	33.5	
224.185500	30.2	1000.0	120.000	104.0	V	190.0	12.5	5.8	36.0	
226.976250	25.1	1000.0	120.000	170.0	V	10.0	12.6	10.9	36.0	

Plot 2: 1 GHz to 12.75 GHz, RX mode, vertical & horizontal polarization



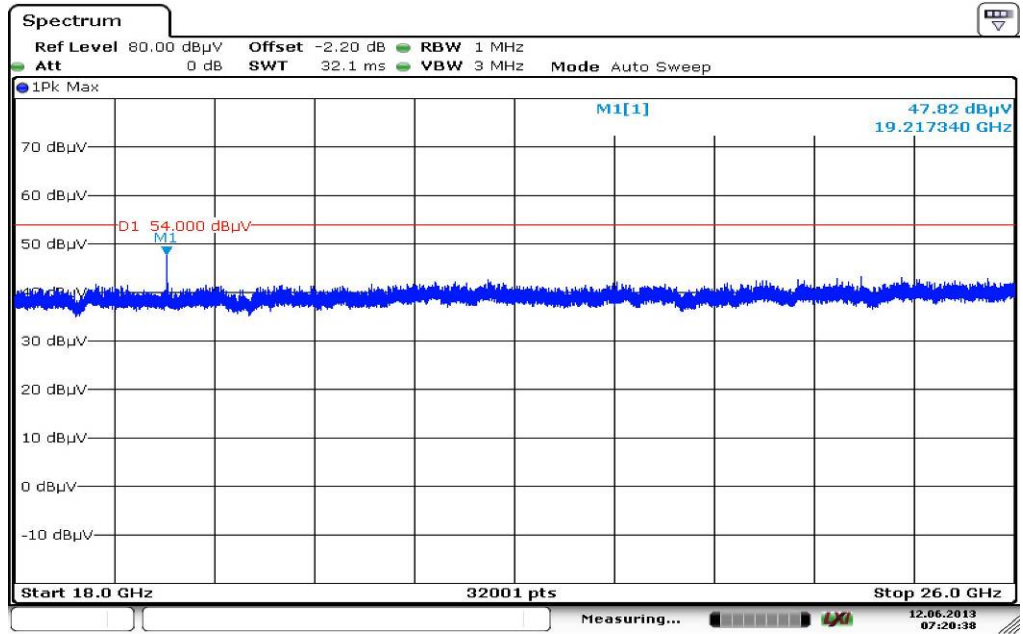
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 3: 12.75 GHz to 18 GHz, RX mode, vertical & horizontal polarization



Date: 12.JUN.2013 07:23:15

Plot 4: 18 GHz to 26 GHz, RX mode, vertical & horizontal polarization



Date: 12.JUN.2013 07:20:38

10.13 Spurious emissions radiated < 30 MHz

Not performed – reduced test plan!

10.14 Spurious emissions conducted < 30 MHz

Description:

Measurement of the conducted 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. Both power lines, phase and neutral line, are measured. Found peaks are remeasured with average and quasi peak detection to show compliance to the limits.

Measurement:

Measurement parameter	
Detector:	Peak - Quasi peak / average
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
TX spurious emissions conducted < 30 MHz		
Frequency (MHz)	Quasi-peak (dBµV/m)	Average (dBµV/m)
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30.0	60	50

*Decreases with the logarithm of the frequency

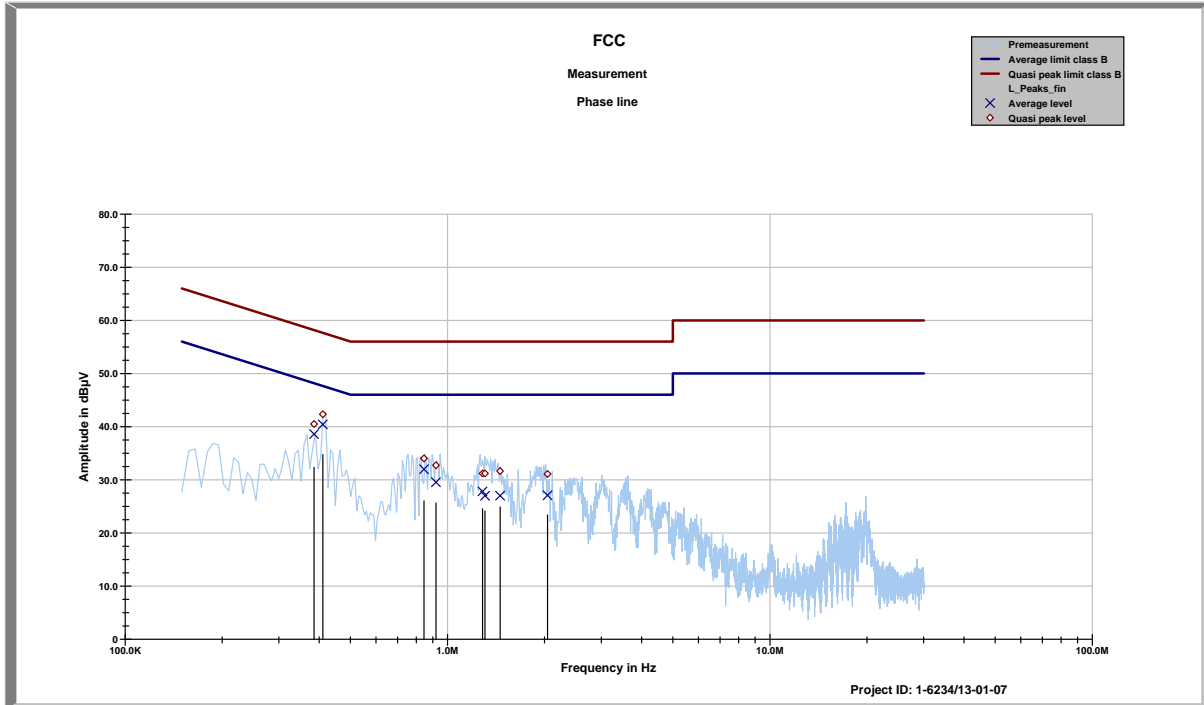
Results:

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

Result: Passed

Plots:

Plot 1: 150 kHz to 30 MHz, TX mode, phase line



FCC
Phase line tbl

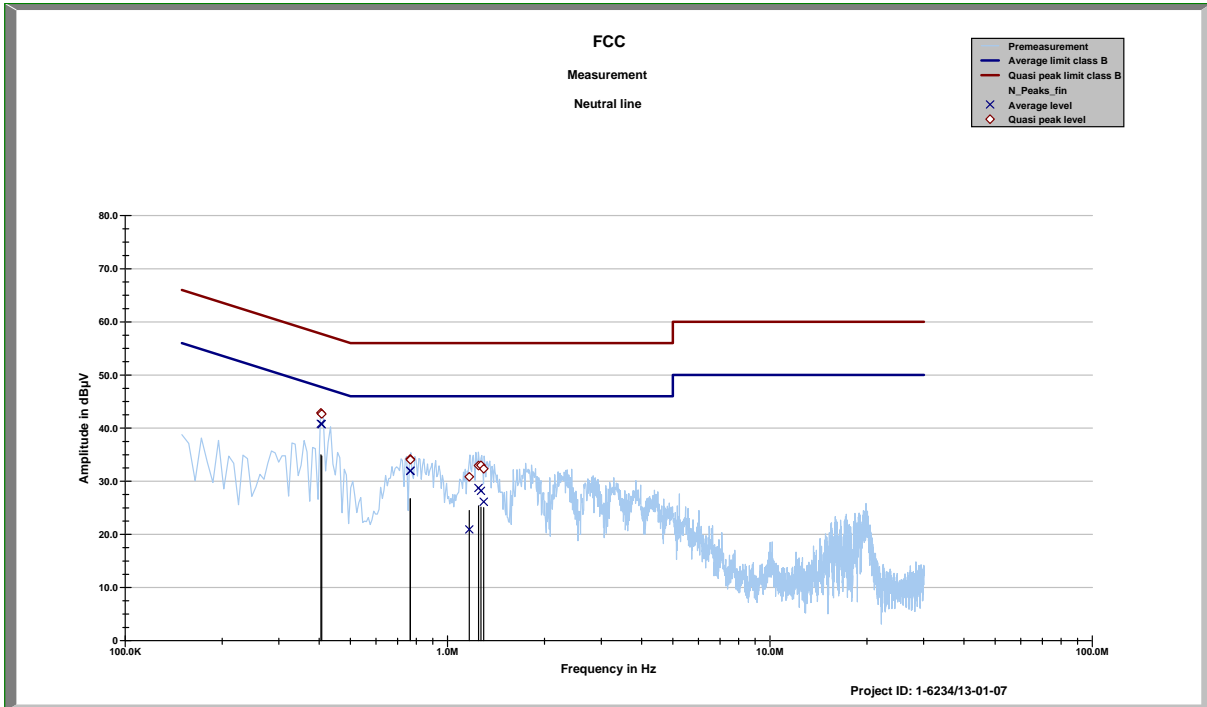
Project ID: 1-6234/13-01-07

01:45:11 PM, Thursday, May 23, 2013

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.38561	40.48	17.67	38.61	10.66
0.41032	42.35	15.30	40.42	8.14
0.84517	34.04	21.96	31.97	14.03
0.92021	32.73	23.27	29.54	16.46
1.2836	31.20	24.80	27.82	18.18
1.3068	31.20	24.80	27.00	19.00
1.4551	31.62	24.38	27.00	19.00
2.0414	31.10	24.90	27.07	18.93

Project ID - 1-6234/13-01-07
 EUT - RFU81UW
 Serial Number - imei:004402242283665
 Operating mode - BT DH5 tx + charging

Plot 2: 150 kHz to 30 MHz, TX mode, neutral line



FCC

Neutral line tbl

Project ID: 1-6234/13-01-07

01:45:11 PM, Thursday, May 23, 2013

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.40462	42.86	14.90	40.80	7.92
0.40709	42.66	15.04	40.74	7.91
0.76585	34.19	21.81	31.93	14.07
0.76688	34.05	21.95	31.98	14.02
1.16796	30.83	25.17	20.93	25.07
1.24747	32.94	23.06	28.73	17.27
1.26945	33.00	23.00	28.19	17.81
1.2951	32.33	23.67	26.14	19.86

Project ID - 1-6234/13-01-07

EUT - RFU81UW

Serial Number - imei:004402242283665

Operating mode - BT DH5 tx + charging

11 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 3	R&S	100083	300003312	k	09.01.2013	09.01.2014
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.	TRILOG 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	16.01.2013	16.01.2014
12	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vIKI!	08.05.2013	08.05.2015
13	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
14	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	*	300000199	ne		
15	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156	ne		
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.	Amplifier	js42- 00502650- 28-5a	Parzich GMBH	928979	300003143	ne		
19	n. a.	Band Reject filter	WRCG240 0/2483- 2375/2505- 50/10SS	Wainwright	11	300003351	ev		
20	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologi es	MY51210197	300004405	k	21.02.2013	21.02.2014
21	11b	Microwave System Amplifier, 0.5- 26.5 GHz	83017A	HP Meßtechnik	00419	300002268	ev		
22	A025	Std. Gain Horn	639	Narda		300000786	ne		

		Antenna 12.4 to 18.0 GHz							
23	A027	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda		300000486	ne		
24	n. a.	Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517	k	22.10.2012	22.10.2013
25	n. a.	CBT (Bluetooth Tester + EDR Signalling)	CBT 1153.9000 K35, CBT-B55, CBT-K55	R&S	100313	300003516	vlk!	21.08.2012	21.08.2014

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

12 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	2013-06-13
-A	More detailed result table for Band Edge Compliance added	2013-06-17

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

Front side of certificate



Deutsche Akkreditierungsstelle GmbH

Befehlene gemäß § 8 Absatz 1 AkkStelleG i.V.m. § 1 Absatz 1 AkkStelleGBV
 Unterzeichnerin der Multilateralen Abkommen
 von EA, ILAC und IAF zur gegenseitigen Anerkennung

Akkreditierung



Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Prüflaboratorium

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

die Kompetenz nach DIN EN ISO/IEC 17025:2005 besitzt, Prüfungen in folgenden Bereichen durchzuführen:

- Drahtgebundene Kommunikation einschließlich xDSL**
- VoIP und DECT
- Akustik
- Funk einschließlich WLAN
- Short Range Devices (SRD)
- RFID
- WiMax und Richtfunk
- Mobilfunk (GSM / DCS, Over the Air (OTA) Performance)
- Elektromagnetische Verträglichkeit (EMV) einschließlich Automotive
- Produktsicherheit
- SAR und Hearing Aid Compatibility (HAC)
- Umweltsimulation
- Smart Card Terminals
- Bluetooth
- Wi-Fi- Services

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Registrierungsnummer der Urkunde: D-PL-12076-01-01

Frankfurt am Main, 18.01.2013
Siehe Hinweis auf der Rückseite

Im Auftrag
 Dr. Ingrid Röhler
 Abteilungsleiter

Back side of certificate

Deutsche Akkreditierungsstelle GmbH

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Der aktuelle Stand der Mitgliedschaft kann folgenden Webseiten entnommen werden:
 EA: www.european-accreditation.org
 ILAC: www.ilac.org
 IAF: www.iaf.nu

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/eu/de/cetecom-group/europa/deutschland-saarbruecken/akkreditierungen.html>