

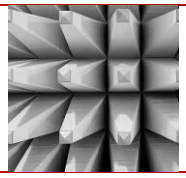

CETECOM™
CETECOM ICT Services
consulting - testing - certification

TEST REPORT

Test Report No.: 1-5579/12-01-12

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

Testing Laboratory

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

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

Applicant

Research In Motion Limited
305 Phillip Street
Waterloo, ON N2L 3W8
CANADA
Phone: +1 51 98 88 74 65
Fax: +1 51 98 88 69 06
Contact: Masud Attayi
e-mail: mattayi@rim.com

Manufacturer

Same as Applicant

Test Standard/s

47CFR15	2009-10	Subpart B - Unintentional Radiators
ICES-003, Issue 4	2004-02	Interference-Causing Equipment Standard Digital Apparatus

Test Item

Kind of test item:	**Smartphone**
Model name:	**RFN81UW**
FCC ID:	L6ARFN80UW
IC:	2503A-RFN80UW
S/N serial number:	IMEI:004401139252122 and 004401139252155
HW hardware status:	53015-001 Rev2-905-01
SW software status:	127.0.1.3123
Power Supply:	AC 115V/60Hz

This test report is electronically signed and valid without handwritten signature. The public keys can be requested at the test laboratory to verify the electronic signatures.

Test performed:

cn=Joachim Wolsdorfer, o=CETECOM ICT, ou=WLD-110901, email=joachim.wolsdorfer@cetecom.com, c=DE
2013.03.04 13:39:31 +01'00'

Joachim Wolsdorfer
Testing Manager

Test Report authorised:

cn=Uli Kraus, o=CETECOM ICT, ou=KRA-100118, email=uli.kraus@ict.cetecom.de, c=DE
2013.03.04 15:56:54 +01'00'

Uli Kraus
Senior Testing Manager

1 Table of contents

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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In no case this test report can be considered as a Letter of Approval.

This test report is electronically signed and valid without handwritten signature. For verification of the electronical 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:	2012-12-04
Start of test:	2012-12-06
End of test:	2013-02-08
Person(s) present during the test:	-/-

3 Test standard/s:

Test Standard	Version	Test Standard Description
47CFR15	2009-10	Subpart B - Unintentional Radiators
ICES-003, Issue 5	2012-08	Interference-Causing Equipment Standard Digital Aparatus

4 Test Environment

Temperature:	20°C – 25°C
Relative humidity content:	30 % - 50 %
Air pressure:	1020 hPa
Power supply:	230 V / 50 Hz

5 Test Laboratories sub-contracted

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6 Information about Test Conditions

6.1 Test Item

Kind of test item :	**Smartphone**		
Type identification :	**RFN81UW**		
Equipment classification:	Equipment for portable use		
Environment classification:	Residential, commercial and light industry		
Supply voltage :	AC 115 V/ 60 Hz		
Ports : **(maximum cable lengths declared by manufacturer)**	**Description**	**Direction**	**Length**
	AC power port	Input	> 3m
	Signal/control/DC power port: USB	In / output	< 3m
	Signal/control port: headset	In / output	< 3m
Is mounting position / usual operating position defined?			Hand-Held
Additional information:			
conducted emission in NFC mode has been performed using a demiload cover, provided by customer			

6.2 EUT: Type, S/N etc. and Short Descriptions Used in this Test Report

short descrip-tion*)	EUT	Type	S/N serial number	HW hardware status	SW software status
EUT A	Smartphone	RFN81UW	IMEI: 004401139252122	53015-001 Rev2-905-01	127.0.1.3123
EUT B	Smartphone	RFN81UW	IMEI: 004401139252155	53015-001 Rev2-905-01	127.0.1.3123

*) EUT short description is used to simplify the identification of the EUT in this test report.

6.3 Auxiliary Equipment (AE): Type, S/N etc. and Short Descriptions

AE descrip -tion*)	Auxiliary equipment	Type	S/N serial number	HW hardware status	SW software status
AE A	Headset	HDW-44306-003 Cresyn (HS1)	-/-	unknown	-/-
AE B	Headset	HDW-44306-003 Hosiden (HS2)	-/-	unknown	-/-
AE C	Headset	HDW-49299-003 Black Bird (HS3)	-/-	unknown	-/-
AE E	AC charger	HDW-24481-001 NA Cobra Fixed Blade Charger (Flextronics) (Model: RIM-C-0004ADUUS); (CH1)	-/-	unknown	-/-
AE F	AC charger	HDW-24481-001 NA Cobra Fixed Blade Charger (Phihong) (Model: PSM04A-050QRIM); (CH2)	-/-	unknown	-/-
AE G	AC charger	HDW-47725-001 NA Cobra OMTP (850 mA) Charger (Flextronics) (Model RIM-C-0004ADUUS) (CH3)	-/-	unknown	-/-
AE H	AC charger	HDW-46445-00x Scarlet NA 850mA Charger, USB-A – Black (CH4)	-/-	unknown	-/-
AE I	AC charger	HDW-34724-001 NAFB 1.8A with captive cable (CH5)	-/-	unknown	-/-
AE J	AC charger	HDW-53513-00x Cobra EU 850mA Charger (Salcomp) (CH6)	-/-	unknown	-/-
AE K	AC charger	HDW-53514-00x Cobra UK 850mA Charger (Salcomp) (CH7)	-/-	unknown	-/-
AE L	AC charger	HDW-29713-00x Cobra EU Charger (Salcomp) (Model: RM0100) (CH8)	-/-	unknown	-/-
AE M	AC charger	HDW-29713-00x Cobra EU Charger (Phihong) (Model: PSM04K-050QRIM) (CH9)	-/-	unknown	-/-
AE N	AC charger	HDW-46447-00x Alt. Low Cost Charger, UK, 850mA (Flextronics) (CH10)	-/-	unknown	-/-
AE O	AC charger	HDW-46446-00x Alt. Low Cost Charger, EU, 850mA (Flextronics) (CH11)	-/-	unknown	-/-

AE P	AC charger	HDW-29714-00x Cobra UK Charger (Phihong) (Model: PSM04K-050QRIM) (CH12)	-/-	unknown	-/-
AE Q	AC charger	HDW-29714-00x Cobra UK Charger (Salcomp) (CH13)	-/-	unknown	-/-
AE R	AC charger	HDW-34725-002 WWTC 2.0A (Playbook R-053 Mod) (CH15)	-/-	unknown	-/-
AE S	DC charger	HDW-46706-001 12V DC VPA, Micro-USB, Blk - WW - Premium (CH16)	-/-	unknown	-/-
AE T	DC charger	HDW-46705-001 12V DC VPA, Micro-B, Blk - WW - Low Cost (CH17)	-/-	unknown	-/-
AE U1	Data Cable	HDW-28109-003 1.2m USB Cable - B P (USB1)	-/-	unknown	-/-
AE U2	Data Cable	HDW-48415-001 1.0m USB Cable - T P (USB2)	-/-	unknown	-/-
AE U3	Data Cable	HDW-19137-002 USB Y-cable (USB3)	-/-	unknown	-/-
AE U4	Data Cable	HDW-28109-003 Alt. 1 1.2m USB Cable - B H (USB4)	-/-	unknown	-/-
AE U5	Data Cable	HDW-50071-00x Alt. 2 1.2m USB Cable - G P (USB5)	-/-	unknown	-/-
AE U6	Data Cable	HDW-50071-00x Alt. 3 1.2m USB Cable - G H (USB6)	-/-	unknown	-/-
AE U7	Data Cable	HDW-48415-00x Alt. 1 1.0m USB Cable - T H (USB7)	-/-	unknown	-/-
AE U8	Data Cable	HDW-51800-00x Alt.2 1.0m USB Cable - K P (USB8)	-/-	unknown	-/-
AE U9	Data Cable	HDW-51800-00x Alt.3 1.2m!! USB Cable - K H (USB9)	-/-	unknown	-/-
AE V	HDMI cable	HDW-29572-001	-/-	unknown	-/-
AE W	USB charger	ACC1 HDW-53182-001 Booster EBC	-/-	unknown	-/-

*) AE short description is used to simplify the identification of the auxiliary equipment in this test report.

6.4 EUT Set-up(s)

EUT Set-ups for conducted emission

EUT set-up no.*)	Combination of EUT and AE	Remarks
set. 1	EUT A + HS1 + CH1 + USB1	GSM850 idle + charging
set. 2	EUT A + HS2 + CH3 + USB2	PCS1900 idle + charging
set. 3	EUT A + HS3 + CH5	UMTS FDD2 idle + charging
set. 4	-/-	-/-
set. 5	EUT A + HS3 + CH2 + USB5	UMTS FDD5 idle + charging
set. 6	EUT A + HS2 + CH15 + HDMI (+HD monitor)	UMTS FDD5 idle + charging
set. 7	EUT A + HS1 + CH2 + USB1	BT DH5 + charging
set. 8	EUT B + HS2 + CH4 + USB2	802.11b + charging
set. 9	EUT B + HS1 + CH3 + USB6 + ACC1	802.11a + charging
set. 10	EUT A + HS3 + CH5 (Demiload backcover)	NFC mode + charging

EUT Set-ups for radiated emission

EUT set-up no.*)	Combination of EUT and AE	Remarks
set. 11	EUT A+ HS1 + CH1 + USB1	GSM850 idle + charging
set. 12	EUT A+ HS2 + CH2 + USB2	PCS1900 idle + charging
set. 13	EUT A+ HS3 + CH5	UMTS FDD2 idle + charging
set. 14	-/-	-/-
set. 15	EUT A+ HS1 + CH3 + USB4	UMTS FDD5 idle + charging
set. 16	EUT A+ HS2 + CH4 + USB7	UMTS FDD5 idle + charging
set. 17	EUT A+ HS1 + CH15	GSM850 idle + charging

*) EUT set-up no. is used to simplify the identification of the EUT set-up in this test report.

7 Summary of Test Results

☒ No deviations from the technical specifications were ascertained
☐ There were deviations from the technical specifications ascertained

7.1 Emission

7.1.1 Enclosure

EMI Phenomenon	Frequency range	Basic standard	Result
Radiated Interference Field Strength	30 - 1000 MHz	FCC Part 15 Class B	passed
Radiated Interference Field Strength	> 1 GHz	FCC Part 15 Class B	passed

7.1.2 AC Mains Power Input/Output Ports

EMI Phenomenon	Frequency range	Basic standard	Result
Conducted interference voltage	0,15– 30 MHz	FCC Part 15 Class B	passed

Remarks:

NA1	Not tested because not required by used standard
NA2	Test not applicable because port does not exists
NA3	Test not applicable because port only for services
NA4	Test not applicable because port lengths not longer than 3m
NA5	Not tested because not required by customer
NA6	Not tested because used frequency < 108 MHz

7.2 Measurement and Test Set-up

Note: The test configuration is in accordance with the requirements given in the standards in point 3

7.3 Measurement uncertainty

The uncertainty of the measurement equipment fulfils CISPR 16 and the related European and national standards.

The semi anechoic chamber fulfils the requirements of CISPR 16-1 (ANSI C63.4) for a test volume of 3m ∅.

The uncertainty of the measurement equipment fulfils CISPR 16 and the related European and national standards.

The semi anechoic chamber fulfils the requirements of CISPR 16-1 (ANSI C63.4) for a test volume of 3m ∅.

The table below shows the measurement uncertainties for each measurement method. The expended uncertainty (k=2 or 95%) was calculated with worst case values.

Measurement Method	Frequency area Impulse duration time	Description	Expanded uncertainty (k=2 or 95%)
Radiated Emission FCC part 15 B, ANSI C63.4	30 MHz – 18 GHz	- / -	± 4.28 dB
Conducted Emission FCC part 15 B, ANSI C63.4	9 kHz – 30 MHz	- / -	± 3.49 dB

8 Detailed test results - Emission

8.1 Conducted Emission

8.1.1 Instrumentation for Test (see equipment list)

G 1	G 2	F 21									

8.1.2 Test Plan

EUT set-up	see test details		
Operating mode	**Port / Line**	**Limit**	**Result**
see test details	AC power line	FCC part 15 B Class B	passed

EUT set-up	see test details		
Operating mode	**Port / Line**	**Limit**	**Result**
see test details	AC power line	FCC part 15 C Class B	passed

Remark :	Powered by external power supply (115V / 60Hz)

8.1.3 Conducted Limits (Power-Line)

	FCC part 15 B Class B		FCC part 15 B Class A	
Frequency- range	**Quasi-Peak (dBµV)**	**Average (dBµV)**	**Quasi-Peak (dBµV)**	**Average (dBµV)**
0,15 MHz – 0,5 MHz	66-56	56-46	79	66
0,5 MHz -5 MHz	56	46	73	60
5 MHz -30 MHz	60	50	73	60

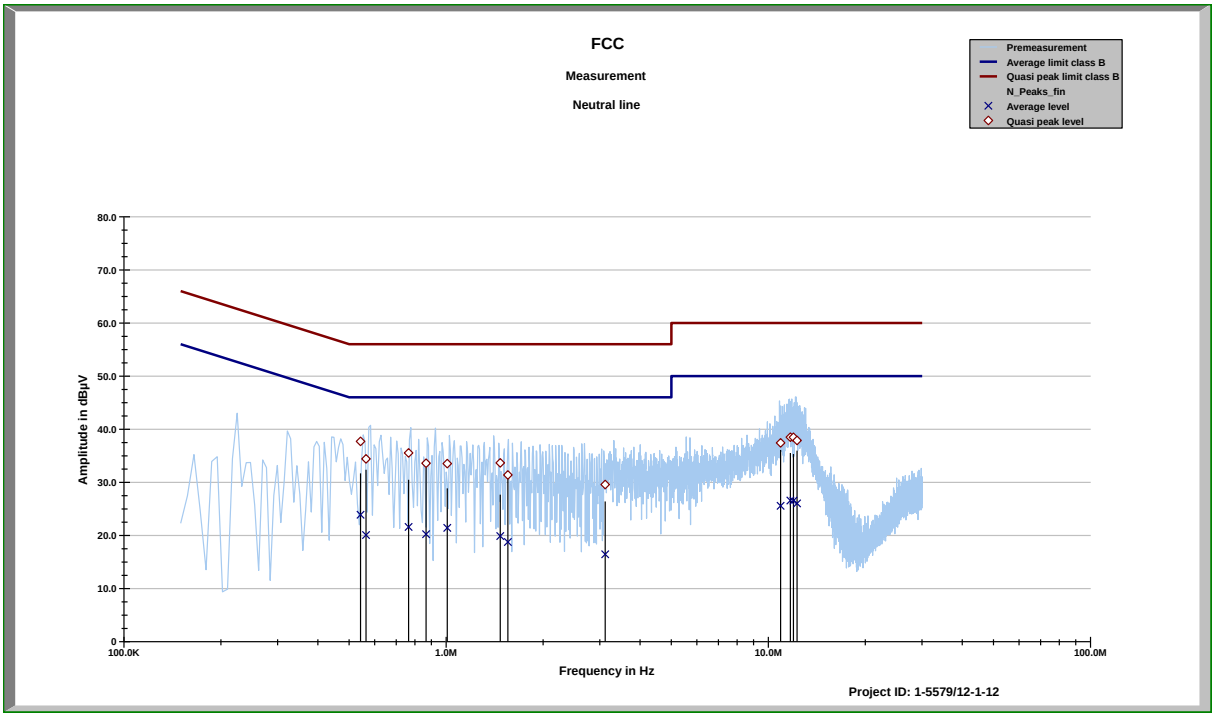
8.1.4 Calibration Information

Device	Serial number	ICT Number	Calibration valid until	Calibration interval
HP 8542 EMI Receiver with RF Filter Unit	3617A00170	300000568	01 / 2014	12 month
ESCI	100083	3000003312	03 / 2013	12 month
VISN ESH 3-Z5	892475/017	300002209	01 / 2014	24 month

Remarks: All emission components and the shielded room were checked weekly
Cable loss: 0.6 to 2.4 dB (150kHz to 30 MHz)

8.1.5 Test Results of Main

set 1

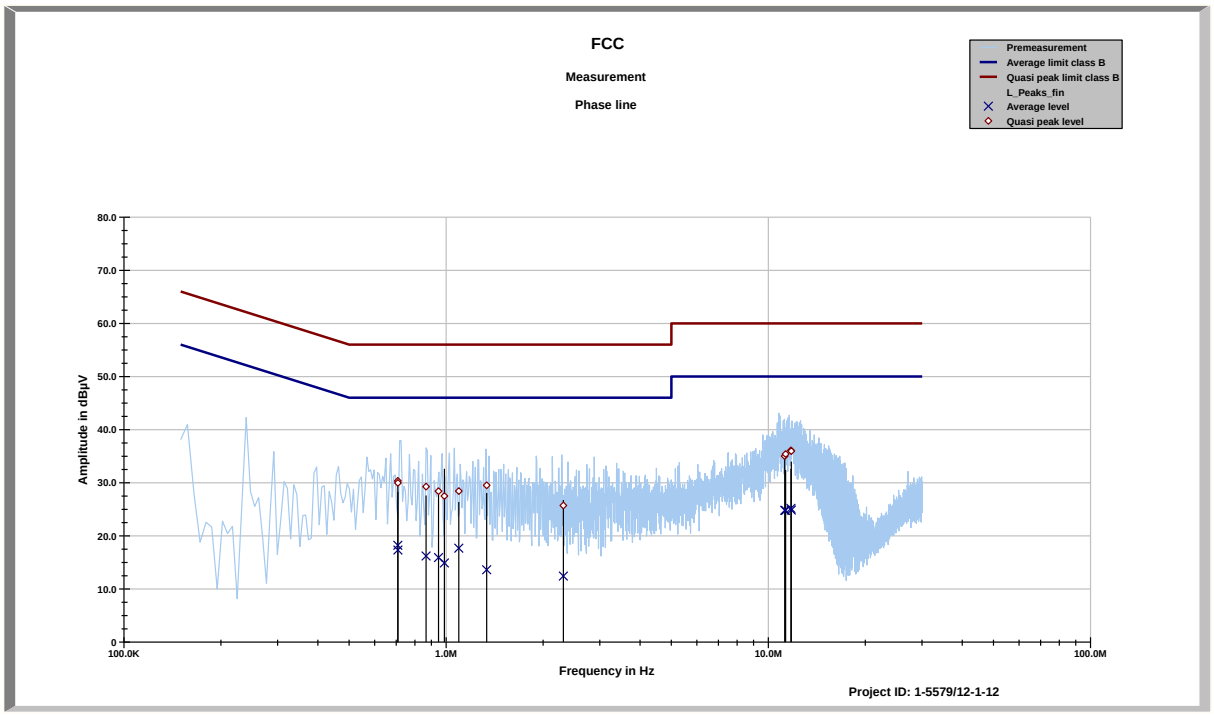


FCC
Neutral line tbl
Project ID: 1-5579/12-1-12

10:32:19 AM, Wednesday, December 19, 2012

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.54228	37.70	18.30	23.89	22.11
0.56396	34.42	21.58	20.07	25.93
0.76476	35.53	20.47	21.59	24.41
0.86652	33.59	22.41	20.23	25.77
1.00792	33.52	22.48	21.42	24.58
1.4719	33.66	22.34	19.88	26.12
1.5538	31.39	24.61	18.76	27.24
3.1157	29.58	26.42	16.45	29.55
10.9127	37.43	22.57	25.57	24.43
11.6967	38.49	21.51	26.57	23.43
11.9558	38.48	21.52	26.53	23.47
12.2738	37.89	22.11	26.03	23.97

Project ID - 1-5579/12-1-12
EUT - RFN81UW
SN - IMEI:004401139252122
Operating mode - GSM850 idle + charging



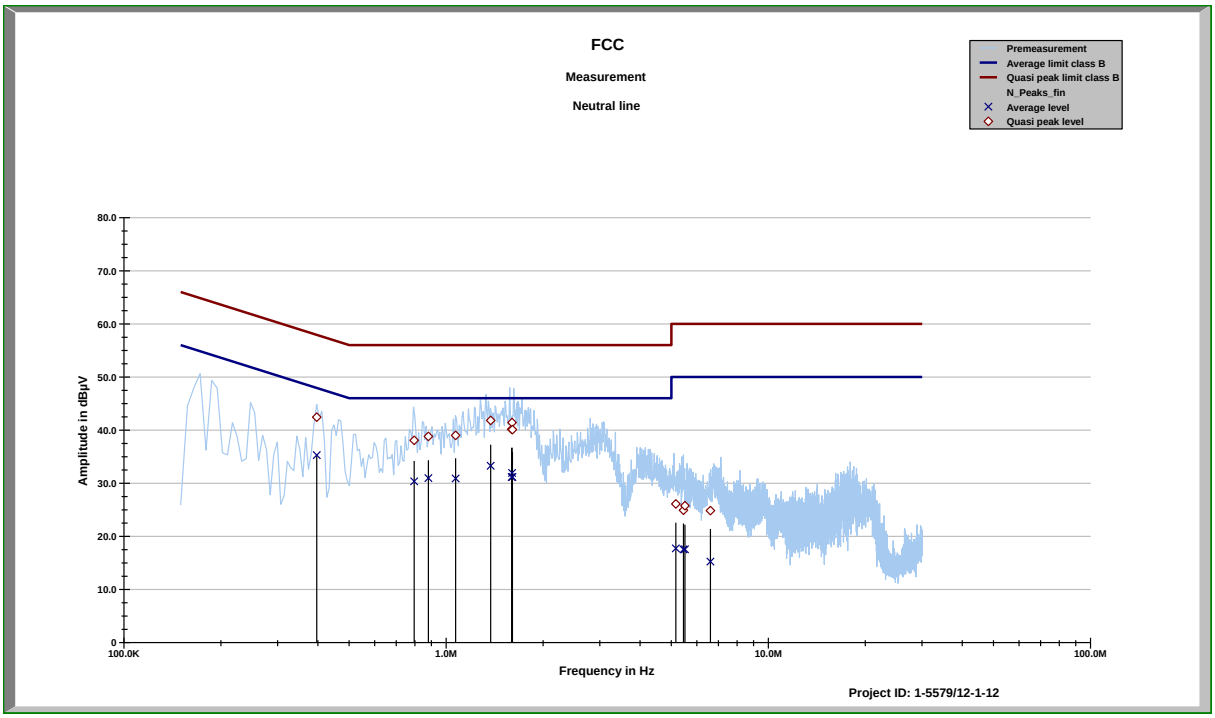
FCC
Phase line tbl
Project ID: 1-5579/12-1-12

10:32:19 AM, Wednesday, December 19, 2012

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.70791	30.35	25.65	18.22	27.78
0.70845	29.97	26.03	17.32	28.68
0.86621	29.27	26.73	16.21	29.79
0.94699	28.41	27.59	15.91	30.09
0.98741	27.50	28.50	14.89	31.11
1.0941	28.42	27.58	17.67	28.33
1.3354	29.52	26.48	13.62	32.38
2.3112	25.71	30.29	12.42	33.58
11.2314	35.02	24.98	24.81	25.19
11.3103	35.39	24.61	24.78	25.22
11.7467	36.09	23.91	25.17	24.83
11.7769	35.96	24.04	24.85	25.15

Project ID - 1-5579/12-1-12
EUT - RFN81UW
SN - IMEI:004401139252122
Operating mode - GSM850 idle + charging

set 2

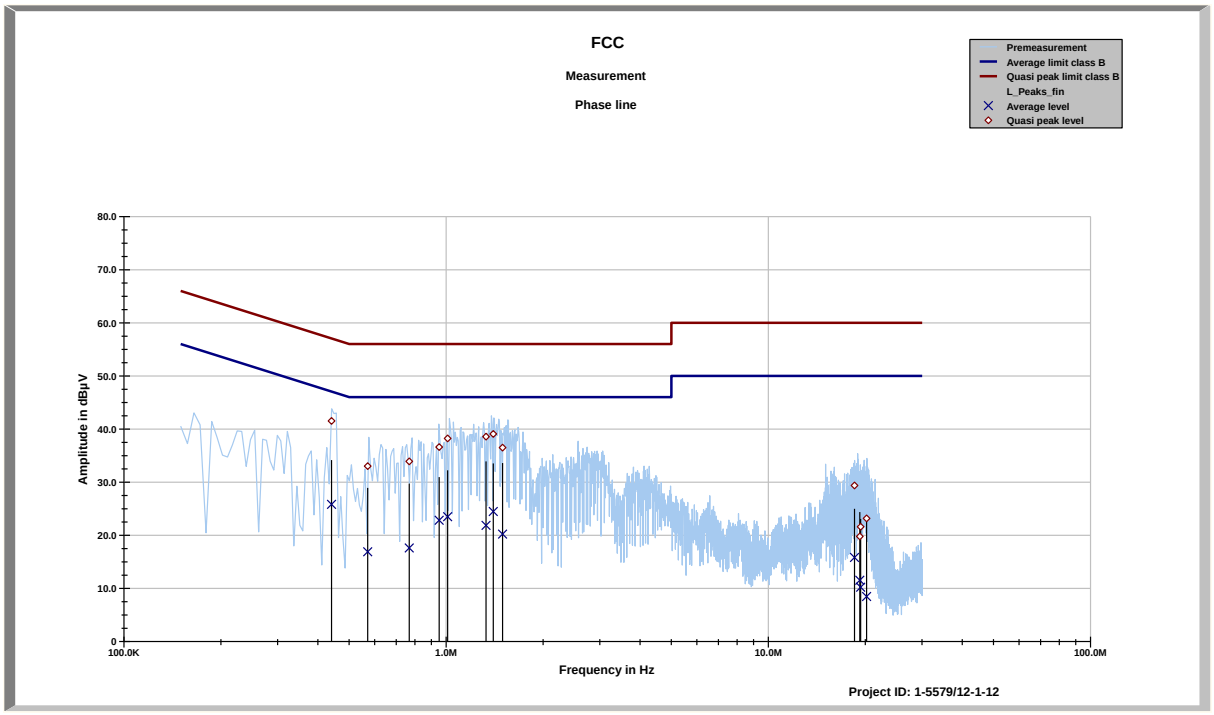


FCC
Neutral line tbl
Project ID: 1-5579/12-1-12

10:59:37 AM, Wednesday, December 19, 2012

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.39668	42.43	15.49	35.28	13.67
0.79583	38.07	17.93	30.35	15.65
0.88071	38.80	17.20	30.97	15.03
1.07019	39.00	17.00	30.90	15.10
1.374	41.83	14.17	33.27	12.73
1.5975	40.15	15.85	31.16	14.84
1.6014	41.41	14.59	31.93	14.07
1.606	40.08	15.92	31.17	14.83
5.1612	26.11	33.89	17.72	32.28
5.4495	24.90	35.10	17.53	32.47
5.5077	25.76	34.24	17.55	32.45
6.607	24.83	35.17	15.24	34.76

Project ID - 1-5579/12-1-12
EUT - RFN81UW
SN - IMEI:004401139252122
Operating mode - PCS1900 idle + charging



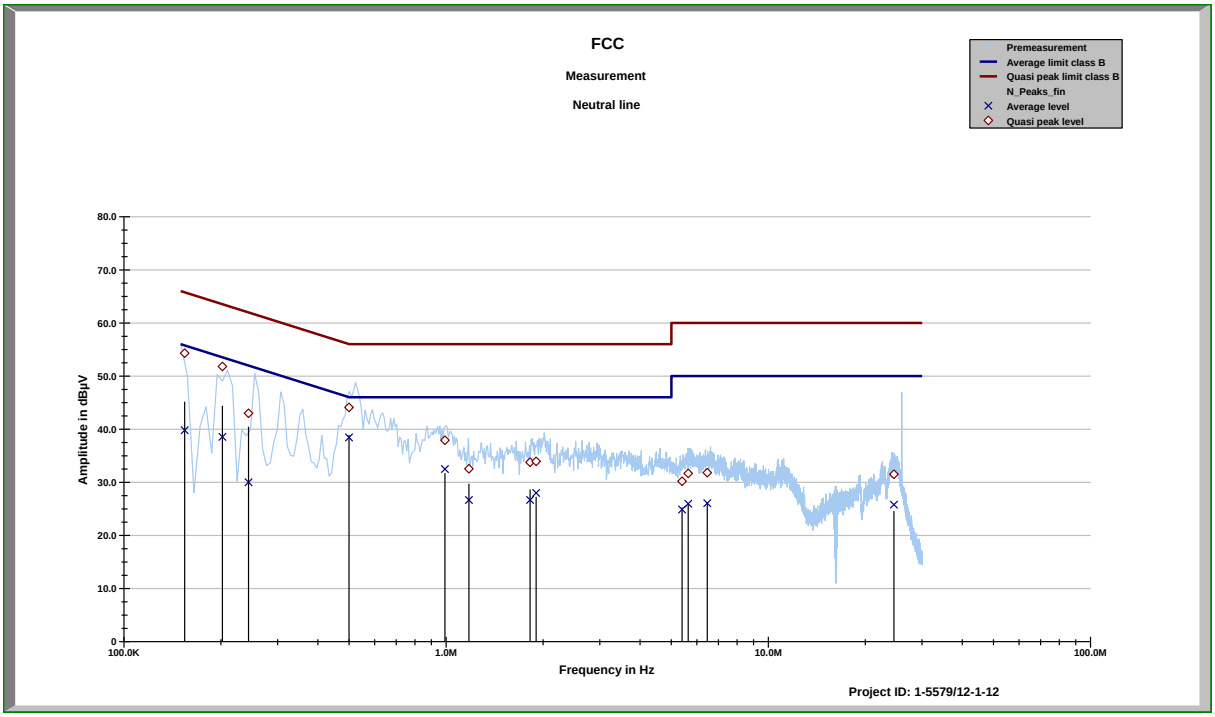
FCC
Phase line tbl
Project ID: 1-5579/12-1-12

10:59:37 AM, Wednesday, December 19, 2012

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.44074	41.52	15.53	25.81	21.88
0.57098	33.01	22.99	16.89	29.11
0.76815	33.91	22.09	17.60	28.40
0.95114	36.61	19.39	22.82	23.18
1.01045	38.22	17.78	23.49	22.51
1.3293	38.57	17.43	21.85	24.15
1.4	39.07	16.93	24.47	21.53
1.4964	36.50	19.50	20.21	25.79
18.501	29.38	30.62	15.82	34.18
19.21	19.78	40.22	11.52	38.48
19.325	21.60	38.40	10.22	39.78
20.171	23.18	36.82	8.46	41.54

Project ID - 1-5579/12-1-12
EUT - RFN81UW
SN - IMEI:004401139252122
Operating mode - PCS1900 idle + charging

set 3

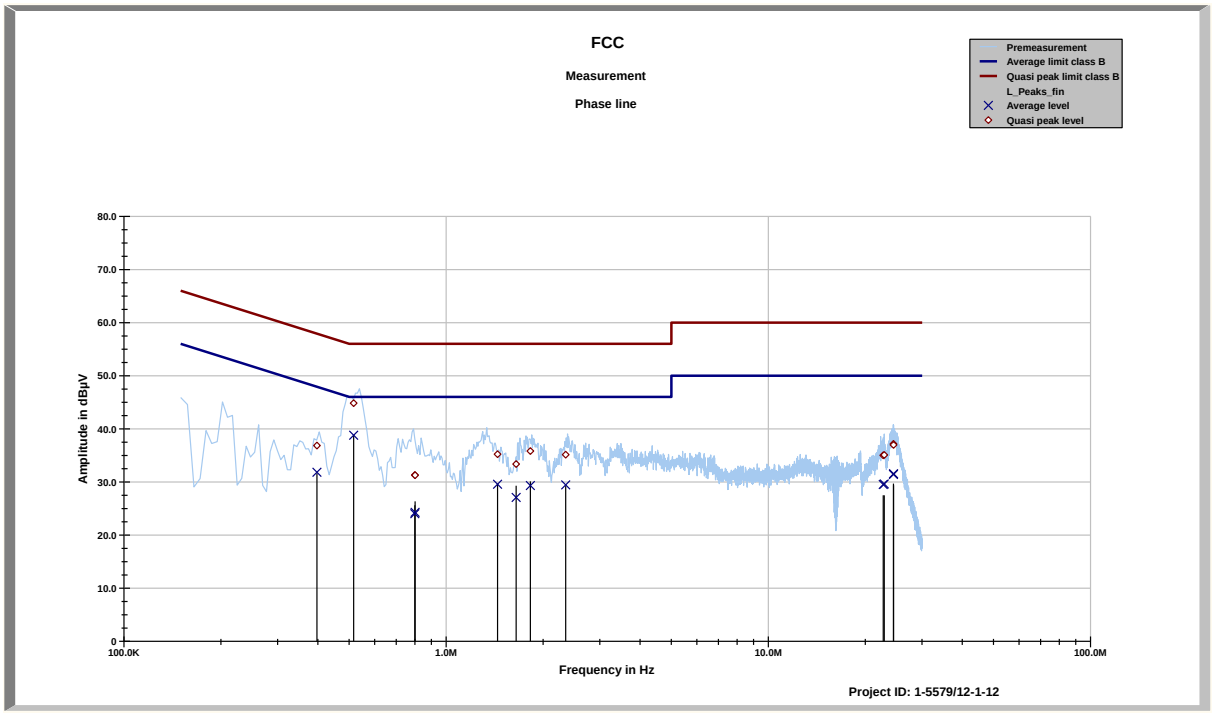


FCC
Neutral line tbl
Project ID: 1-5579/12-1-12

11:21:55 AM, Wednesday, December 19, 2012

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.15435	54.30	11.46	39.81	16.07
0.20207	51.80	11.73	38.55	15.96
0.24359	42.99	18.98	30.01	23.32
0.49941	44.10	11.91	38.43	7.58
0.99159	37.91	18.09	32.49	13.51
1.17682	32.54	23.46	26.66	19.34
1.8218	33.77	22.23	26.67	19.33
1.9015	33.93	22.07	27.99	18.01
5.3952	30.19	29.81	24.87	25.13
5.6375	31.66	28.34	25.96	24.04
6.4604	31.81	28.19	26.06	23.94
24.523	31.50	28.50	25.79	24.21

Project ID - 1-5579/12-1-12
EUT - RFN81UW
SN - IMEI:004401139252122
Operating mode - UMTS FDD2 idle + charging



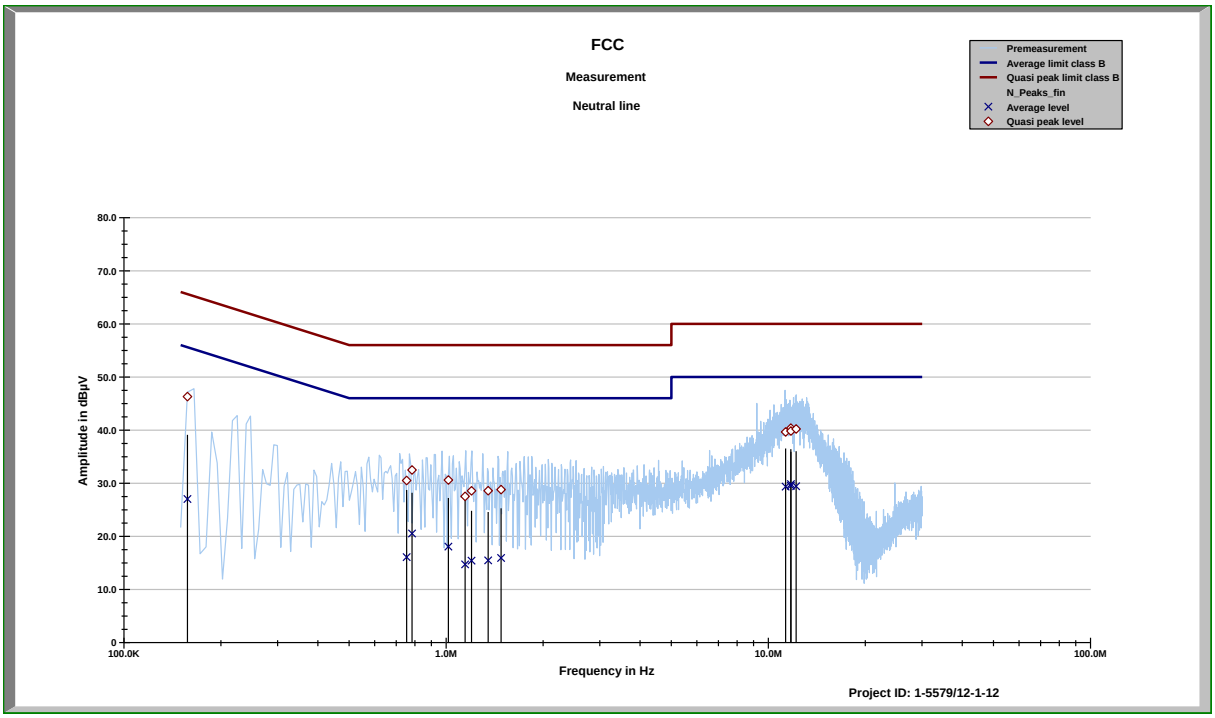
FCC
Phase line tbl
Project ID: 1-5579/12-1-12

11:21:55 AM, Wednesday, December 19, 2012

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.39715	36.85	21.06	31.83	17.11
0.51632	44.84	11.16	38.79	7.21
0.79958	31.29	24.71	24.01	21.99
0.80111	31.27	24.73	24.27	21.73
1.4437	35.21	20.79	29.57	16.43
1.6486	33.36	22.64	27.07	18.93
1.8255	35.82	20.18	29.32	16.68
2.3499	35.13	20.87	29.44	16.56
22.721	35.00	25.00	29.51	20.49
22.876	35.09	24.91	29.62	20.38
24.43	37.17	22.83	31.41	18.59
24.445	36.97	23.03	31.54	18.46

Project ID - 1-5579/12-1-12
EUT - RFN81UW
SN - IMEI:004401139252122
Operating mode - UMTS FDD2 idle + charging

set 5



FCC
Neutral line tbl
Project ID: 1-5579/12-1-12

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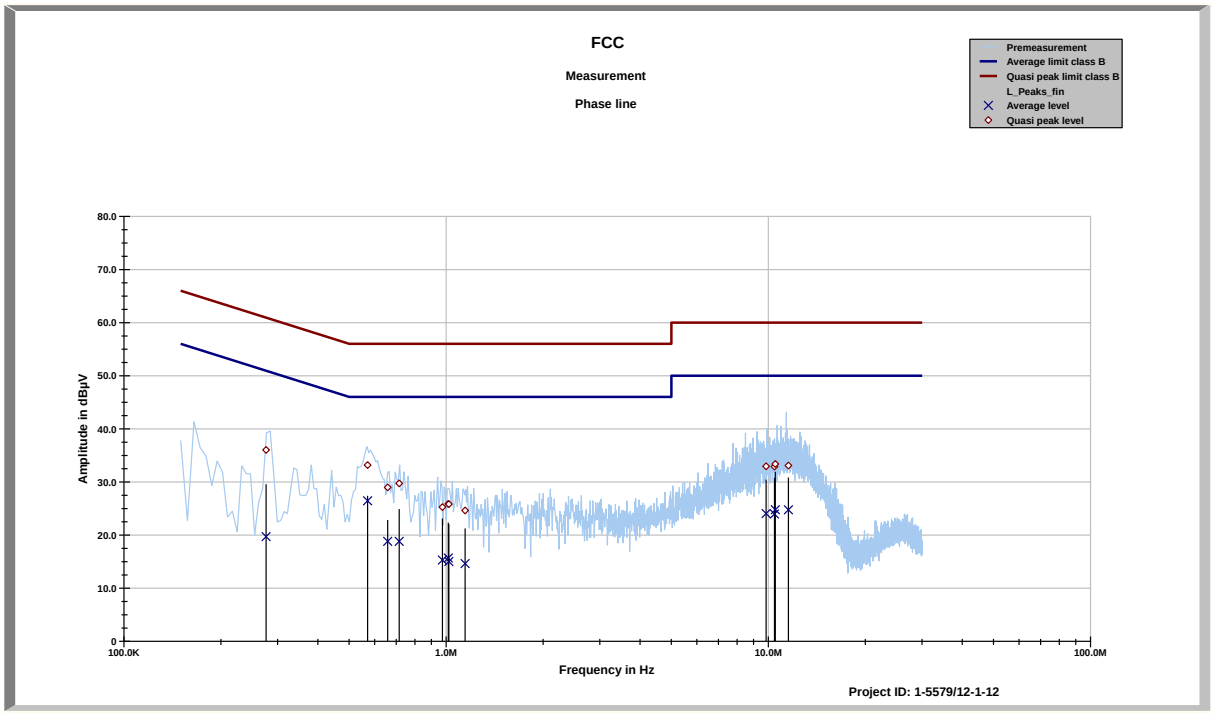
Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.15745	46.30	19.30	27.02	28.77
0.75403	30.51	25.49	16.07	29.93
0.78342	32.49	23.51	20.53	25.47
1.01584	30.59	25.41	18.06	27.94
1.14533	27.51	28.49	14.72	31.28
1.19868	28.57	27.43	15.42	30.58
1.3501	28.58	27.42	15.46	30.54
1.4804	28.79	27.21	15.92	30.08
11.3072	39.65	20.35	29.35	20.65
11.7384	40.36	19.64	29.52	20.48
11.7476	39.83	20.17	29.83	20.17
12.1865	40.20	19.80	29.42	20.58

Project ID - 1-5579/12-1-12
EUT - RFN81UW
SN - IMEI:004401139252122
Operating mode - GSM850 idle + charging



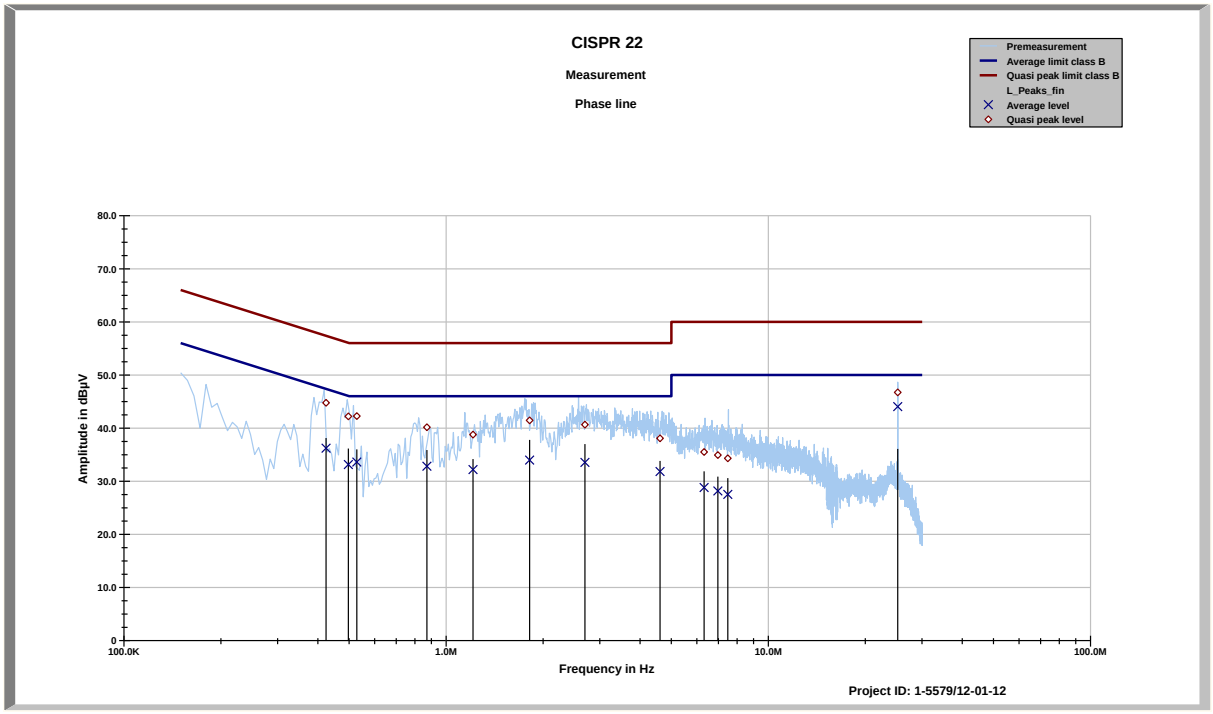
FCC
Phase line tbl
Project ID: 1-5579/12-1-12

11:44:52 AM, Wednesday, December 19, 2012

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.27612	36.03	24.90	19.71	32.69
0.57052	33.17	22.83	26.45	19.55
0.65848	28.98	27.02	18.81	27.19
0.71512	29.72	26.28	18.81	27.19
0.9735	25.26	30.74	15.29	30.71
1.01515	25.86	30.14	15.68	30.32
1.0195	25.82	30.18	15.01	30.99
1.14519	24.63	31.37	14.63	31.37
9.8346	32.94	27.06	24.05	25.95
10.4431	32.89	27.11	23.96	26.04
10.5017	33.39	26.61	24.77	25.23
11.5373	33.09	26.91	24.76	25.24

Project ID - 1-5579/12-1-12
EUT - RFN81UW
SN - IMEI:004401139252122
Operating mode - GSM850 idle + charging

set 6

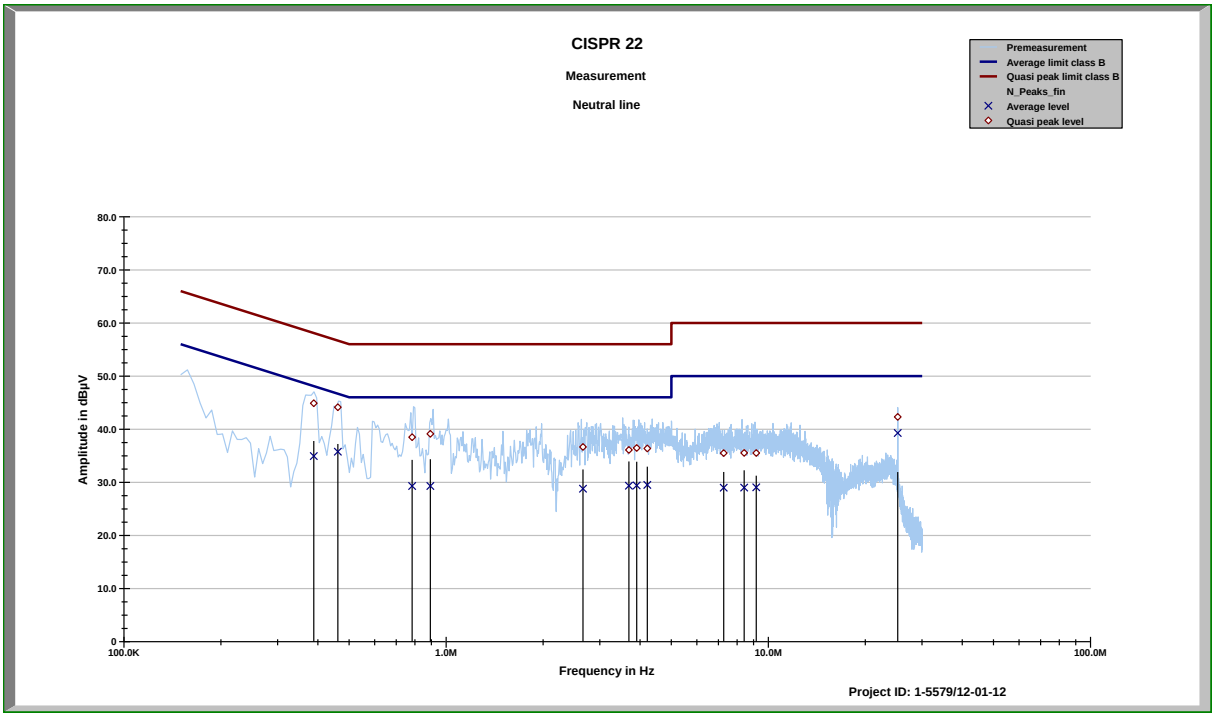


CISPR 22
Phase line tbl
Project ID: 1-5579/12-01-12

10:59:03 AM, Friday, January 18, 2013

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.42392	44.76	12.61	36.22	11.95
0.49708	42.20	13.84	33.14	12.94
0.52812	42.27	13.73	33.61	12.39
0.87131	40.16	15.84	32.82	13.18
1.21154	38.77	17.23	32.18	13.82
1.8157	41.46	14.54	33.98	12.02
2.6953	40.65	15.35	33.54	12.46
4.6094	38.07	17.93	31.83	14.17
6.3155	35.50	24.50	28.80	21.20
6.9667	34.91	25.09	28.16	21.84
7.4831	34.31	25.69	27.51	22.49
25.202	46.73	13.27	44.05	5.95

Project ID - 1-5579/12-01-12
EUT - RFN81UW
Serial Number - IMEI:004401139252122
Operating mode - PCS 1900 idle + charging + HDMI



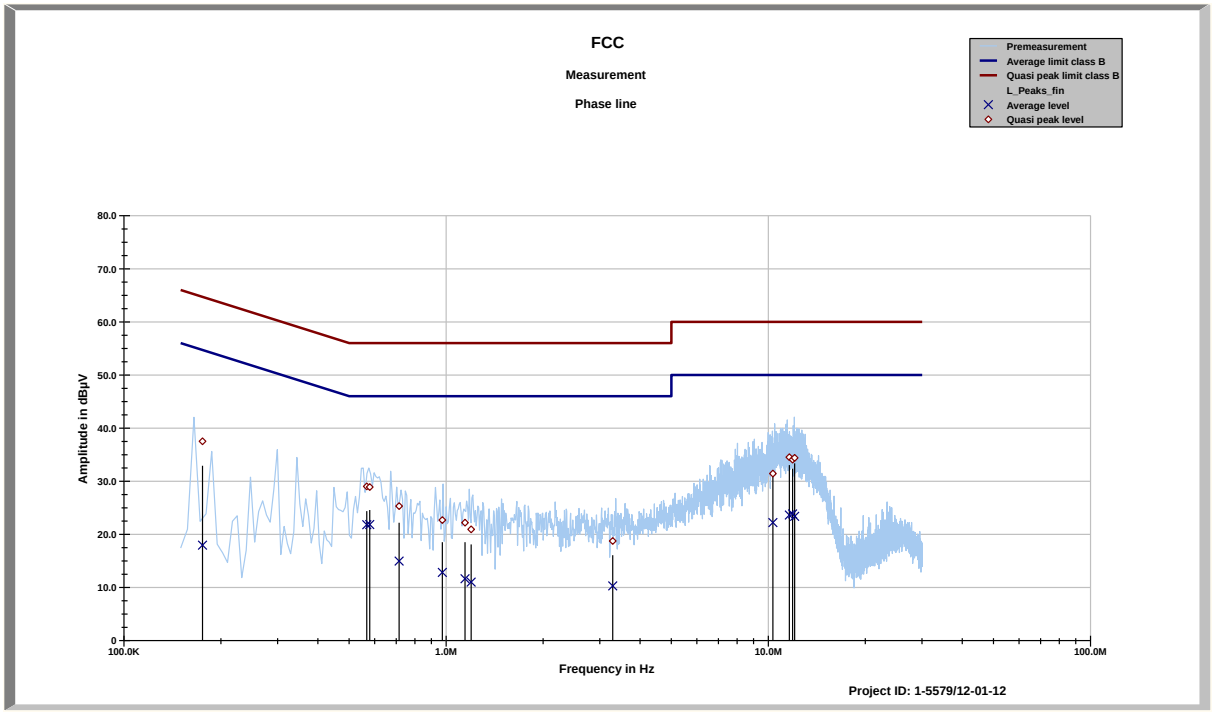
CISPR 22
Neutral line tbl
Project ID: 1-5579/12-01-12

10:59:03 AM, Friday, January 18, 2013

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.38842	44.89	13.21	34.93	14.25
0.46109	44.12	12.55	35.76	11.35
0.78385	38.49	17.51	29.30	16.70
0.89299	39.13	16.87	29.30	16.70
2.6589	36.65	19.35	28.79	17.21
3.6896	36.10	19.90	29.36	16.64
3.9025	36.46	19.54	29.40	16.60
4.2084	36.37	19.63	29.52	16.48
7.267	35.50	24.50	28.99	21.01
8.4113	35.53	24.47	29.01	20.99
9.1676	35.51	24.49	29.05	20.95
25.202	42.32	17.68	39.28	10.72

Project ID - 1-5579/12-01-12
EUT - RFN81UW
Serial Number - IMEI:004401139252122
Operating mode - PCS 1900 idle + charging + HDMI

set 7

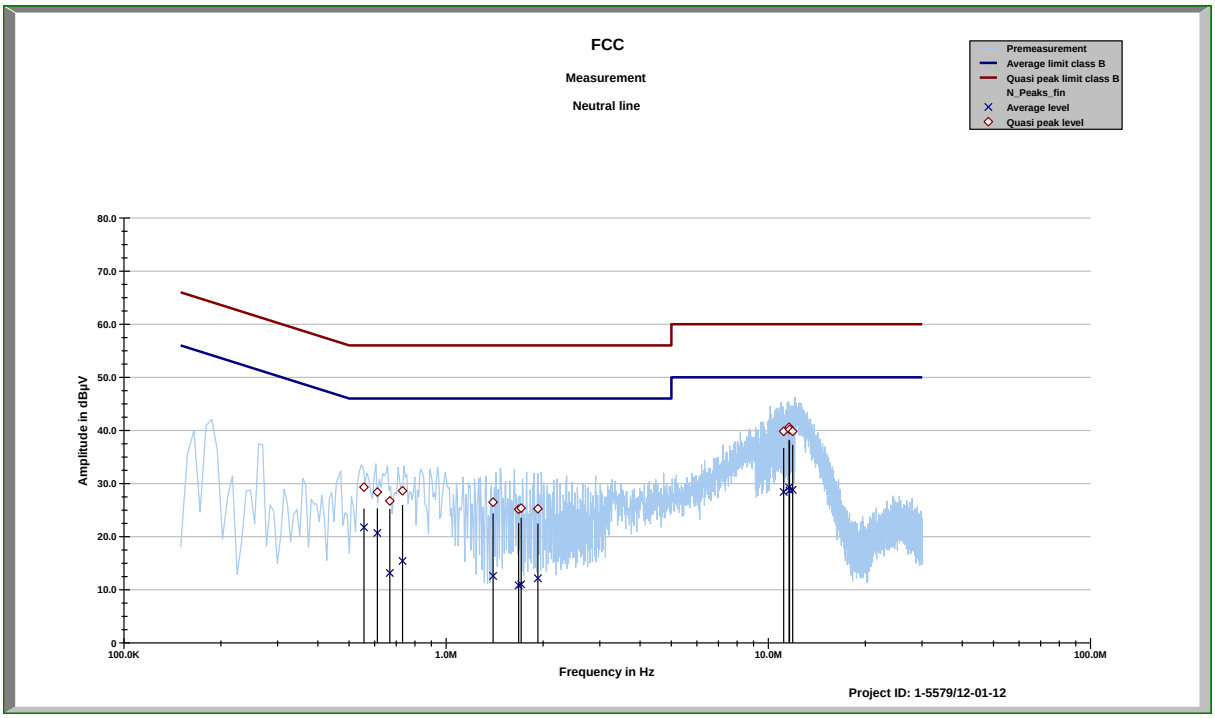


FCC
Phase line tbl
Project ID: 1-5579/12-01-12

11:08:55 AM, Friday, December 21, 2012

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.17534	37.51	27.20	17.96	37.31
0.56687	29.02	26.98	21.80	24.20
0.57922	28.90	27.10	21.85	24.15
0.71442	25.32	30.68	14.97	31.03
0.97324	22.69	33.31	12.83	33.17
1.14421	22.19	33.81	11.63	34.37
1.19511	20.93	35.07	11.01	34.99
3.2868	18.75	37.25	10.29	35.71
10.3247	31.43	28.57	22.22	27.78
11.616	34.52	25.48	23.63	26.37
11.8827	34.07	25.93	23.84	26.16
12.0645	34.41	25.59	23.38	26.62

Project ID - 1-5579/12-01-12
EUT - RFN81UW
Serial Number - IMEI:004401139252122
Operating mode - BT CH39 TX DH5 + charging



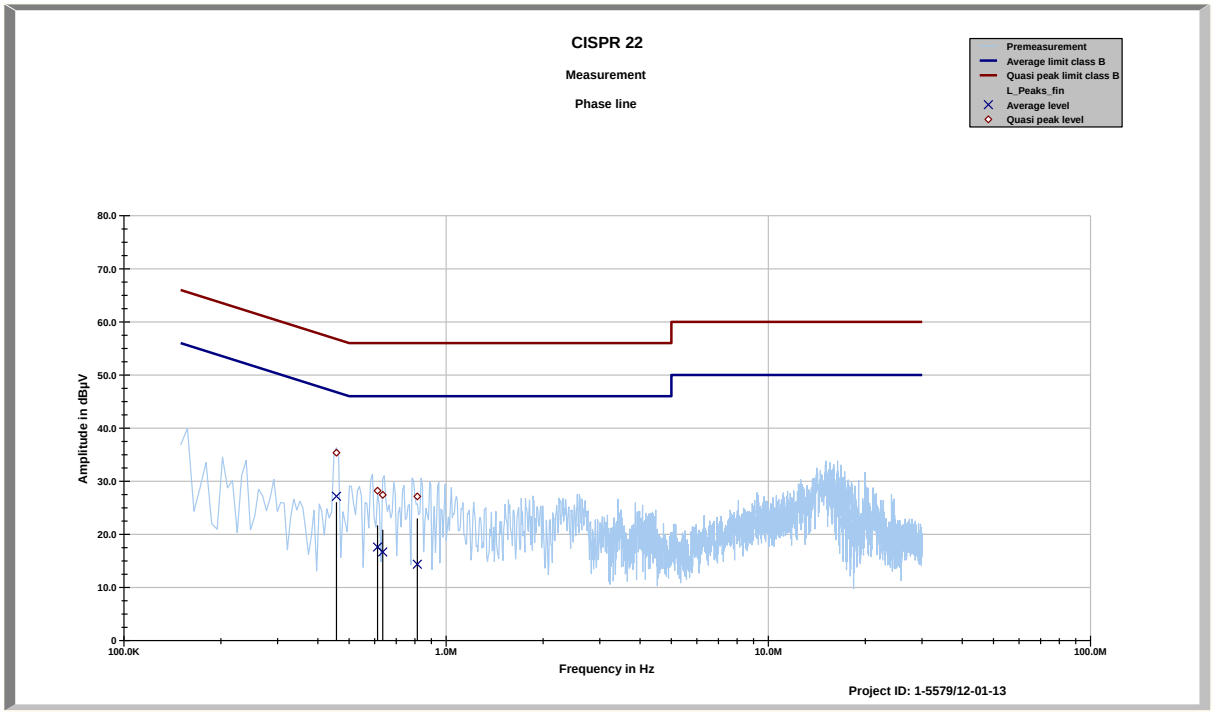
FCC
Neutral line tbl
Project ID: 1-5579/12-01-12

11:08:55 AM, Friday, December 21, 2012

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.55589	29.32	26.68	21.75	24.25
0.61167	28.38	27.62	20.68	25.32
0.6684	26.72	29.28	13.16	32.84
0.73236	28.64	27.36	15.42	30.58
1.3985	26.48	29.52	12.60	33.40
1.6787	25.16	30.84	10.83	35.17
1.709	25.37	30.63	11.03	34.97
1.9254	25.26	30.74	12.16	33.84
11.1527	39.82	20.18	28.42	21.58
11.591	40.59	19.41	29.31	20.69
11.6313	40.17	19.83	28.70	21.30
11.8936	39.83	20.17	28.82	21.18

Project ID - 1-5579/12-01-12
EUT - RFN81UW
Serial Number - IMEI:004401139252122
Operating mode - BT CH39 TX DH5 + charging

set 8

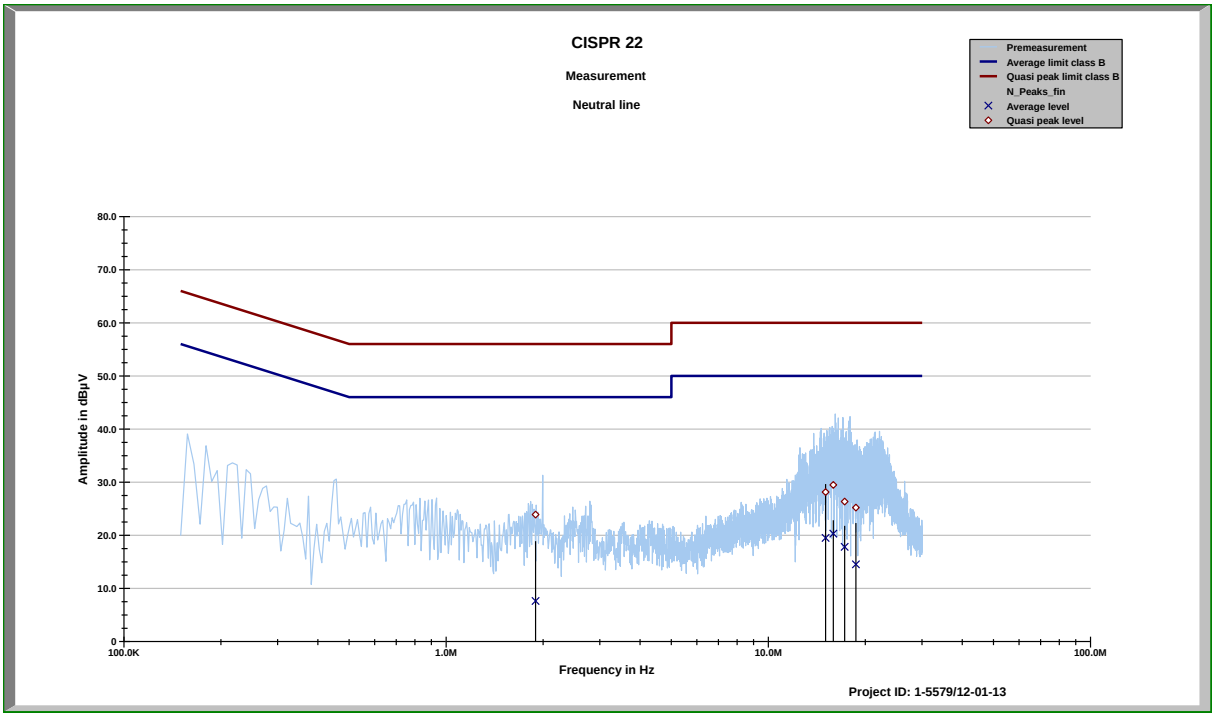


CISPR 22
Phase line tbl
Project ID: 1-5579/12-01-13

02:37:02 PM, Friday, January 18, 2013

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.45651	35.37	21.39	27.16	20.08
0.6123	28.22	27.78	17.61	28.39
0.63582	27.42	28.58	16.68	29.32
0.81365	27.13	28.87	14.37	31.63

Project ID - 1-5579/12-01-13
EUT - RFN81UW
Serial Number - IMEI:004401139252155
Operating mode - 802.11B tx + charging



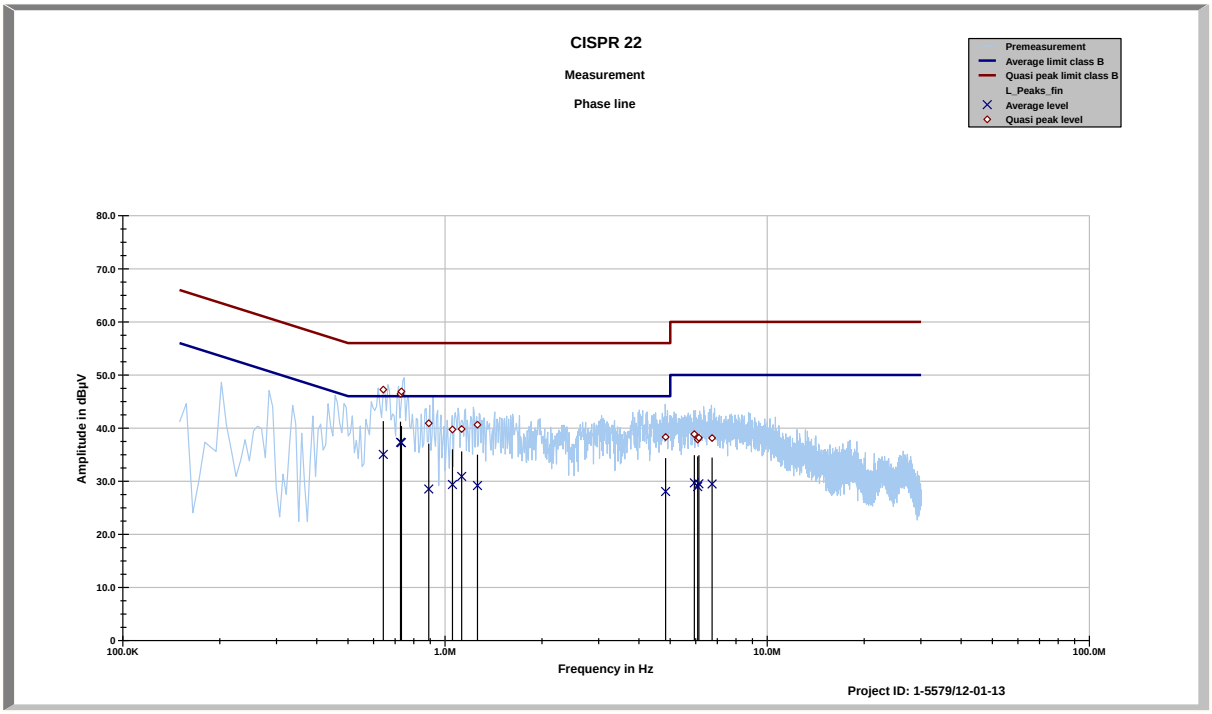
CISPR 22
Neutral line tbl
Project ID: 1-5579/12-01-13

02:37:02 PM, Friday, January 18, 2013

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
1.8943	23.89	32.11	7.62	38.38
15.052	28.13	31.87	19.50	30.50
15.899	29.48	30.52	20.31	29.69
17.242	26.34	33.66	17.81	32.19
18.687	25.20	34.80	14.53	35.47

Project ID - 1-5579/12-01-13
EUT - RFN81UW
Serial Number - IMEI:004401139252155
Operating mode - 802.11B tx + charging

set 9



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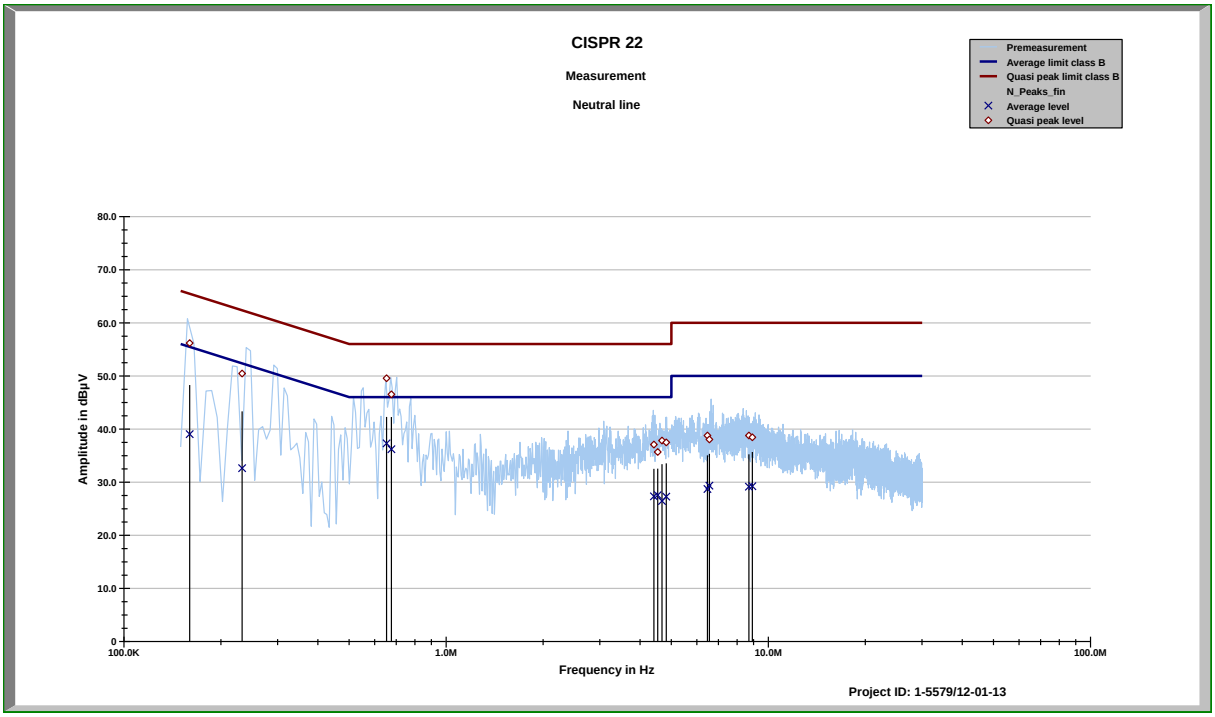
CISPR 22
Phase line tbl
Project ID: 1-5579/12-01-13

03:13:18 PM, Friday, January 18, 2013

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.64347	47.25	8.75	35.04	10.96
0.72746	46.45	9.55	37.33	8.67
0.73229	46.91	9.09	37.25	8.75
0.88992	40.90	15.10	28.53	17.47
1.0544	39.74	16.26	29.37	16.63
1.1263	39.82	16.18	30.89	15.11
1.261	40.64	15.36	29.17	16.83
4.8363	38.31	17.69	28.05	17.95
5.9395	38.87	21.13	29.68	20.32
6.0825	37.84	22.16	28.99	21.01
6.1323	38.17	21.83	29.51	20.49
6.7395	38.12	21.88	29.48	20.52

Project ID - 1-5579/12-01-13
EUT - RFN81UW
Serial Number - IMEI:004401139252155
Operating mode - 802.11a tx + charging



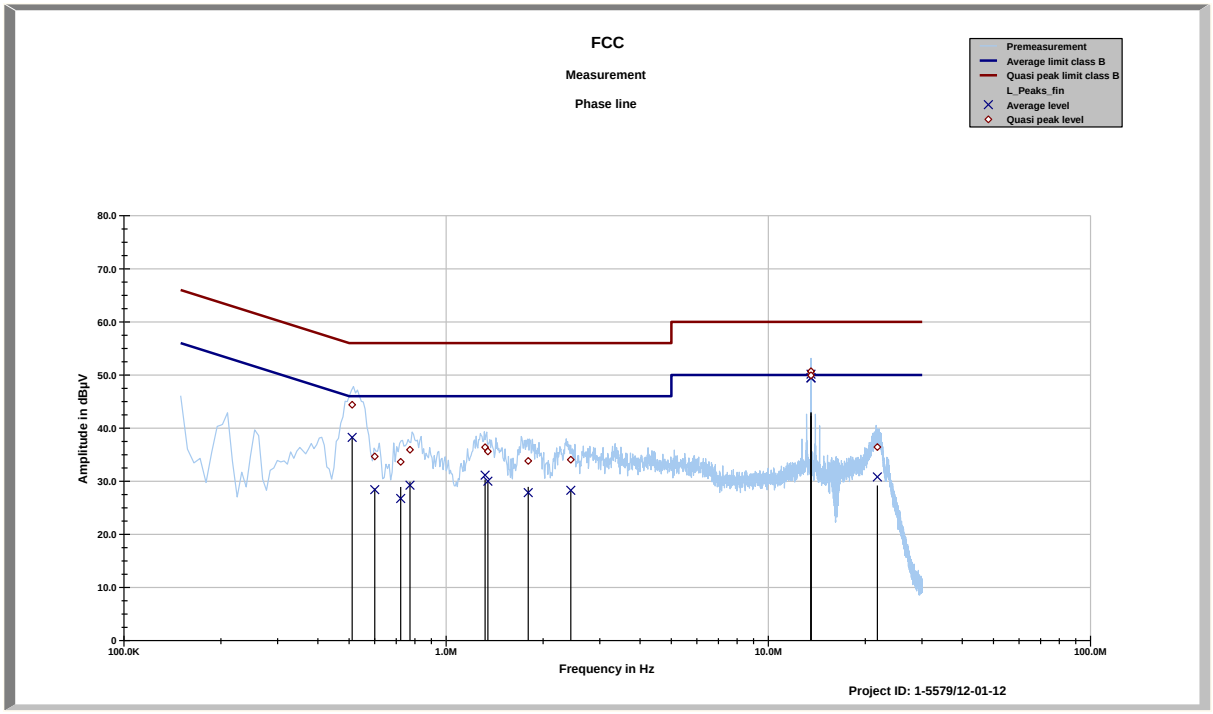
CISPR 22
Neutral line tbl
Project ID: 1-5579/12-01-13

03:13:18 PM, Friday, January 18, 2013

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.15995	56.19	9.28	39.04	16.68
0.23273	50.46	11.89	32.62	21.01
0.6533	49.57	6.43	37.30	8.70
0.67601	46.54	9.46	36.20	9.80
4.4115	37.08	18.92	27.32	18.68
4.5333	35.67	20.33	27.54	18.46
4.6745	37.83	18.17	26.45	19.55
4.8203	37.48	18.52	27.27	18.73
6.4673	38.77	21.23	28.71	21.29
6.5585	38.03	21.97	29.33	20.67
8.6998	38.77	21.23	29.15	20.85
8.9166	38.45	21.55	29.24	20.76

Project ID - 1-5579/12-01-13
EUT - RFN81UW
Serial Number - IMEI:004401139252155
Operating mode - 802.11a tx + charging

set 10

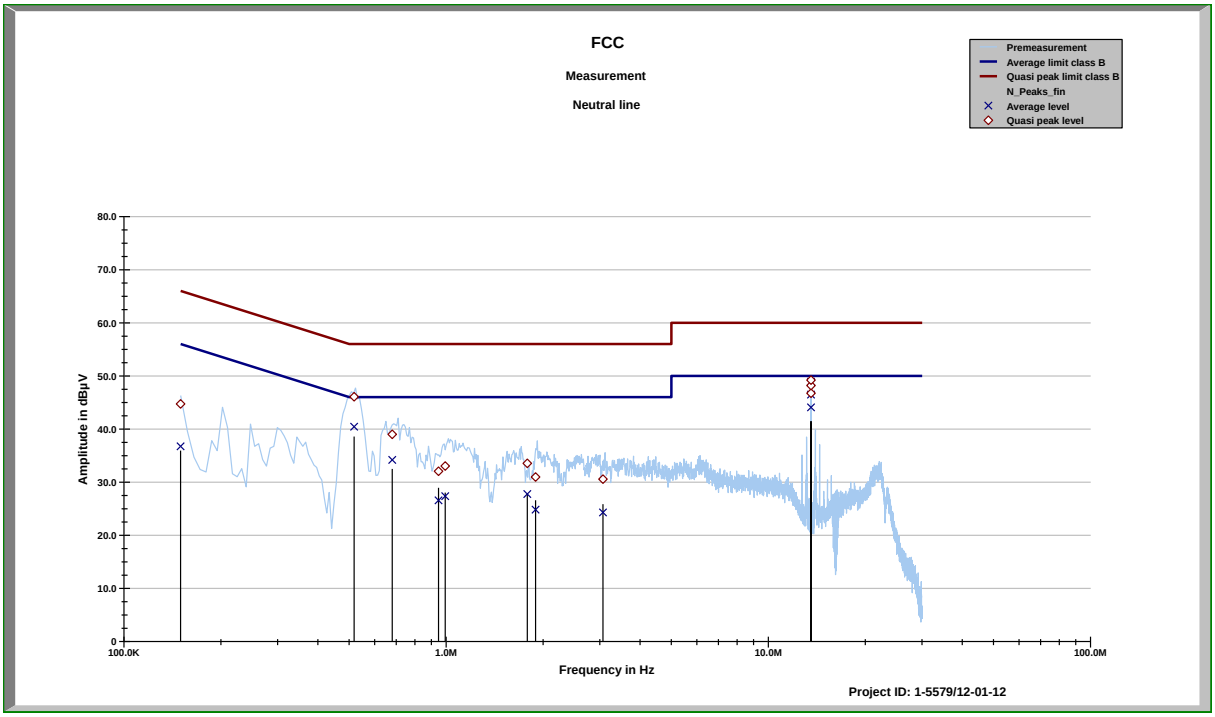


FCC
Phase line tbl
Project ID: 1-5579/12-01-12

03:08:07 PM, Friday, January 25, 2013

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.51083	44.39	11.61	38.26	7.74
0.60042	34.67	21.33	28.41	17.59
0.72273	33.65	22.35	26.75	19.25
0.7724	35.91	20.09	29.26	16.74
1.321	36.40	19.60	31.14	14.86
1.3469	35.61	20.39	30.00	16.00
1.797	33.83	22.17	27.84	18.16
2.4364	34.04	21.96	28.29	17.71
13.557	50.65	9.35	49.48	0.52
13.56	50.69	9.31	49.55	0.45
13.561	49.93	10.07	49.41	0.59
21.779	36.42	23.58	30.80	19.20

Project ID - 1-5579/12-01-12
EUT - RFN81UW Demiload cover
Serial Number - IMEI:004401139252122
Operating mode - AC115V/60Hz cont. NFC + charging



FCC
Neutral line tbl
Project ID: 1-5579/12-01-12

03:08:07 PM, Friday, January 25, 2013

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.14988	44.73	NAN	36.74	NAN
0.51793	46.07	9.93	40.44	5.56
0.68032	39.00	17.00	34.19	11.81
0.9472	32.05	23.95	26.57	19.43
0.99345	33.03	22.97	27.35	18.65
1.786	33.55	22.45	27.75	18.25
1.8948	30.97	25.03	24.81	21.19
3.0666	30.56	25.44	24.29	21.71
13.555	46.74	13.26	44.07	5.93
13.556	48.20	11.80	46.49	3.51
13.56	49.22	10.78	48.91	1.09

Project ID - 1-5579/12-01-12
EUT - RFN81UW Demiload cover
Serial Number - IMEI:004401139252122
Operating mode - AC115V/60Hz cont. NFC + charging

8.1.6 Signal strength calculation

Calculation formula:
SS = UR + CF + VC

List of abbreviations:
SS ► signal strength
UR ► voltage at the receiver
CF ► loss of the cable and filter (passband filter 130 kHz – 30 MHz)
VC ► correction factor of the ISN (ESH3-Z5)

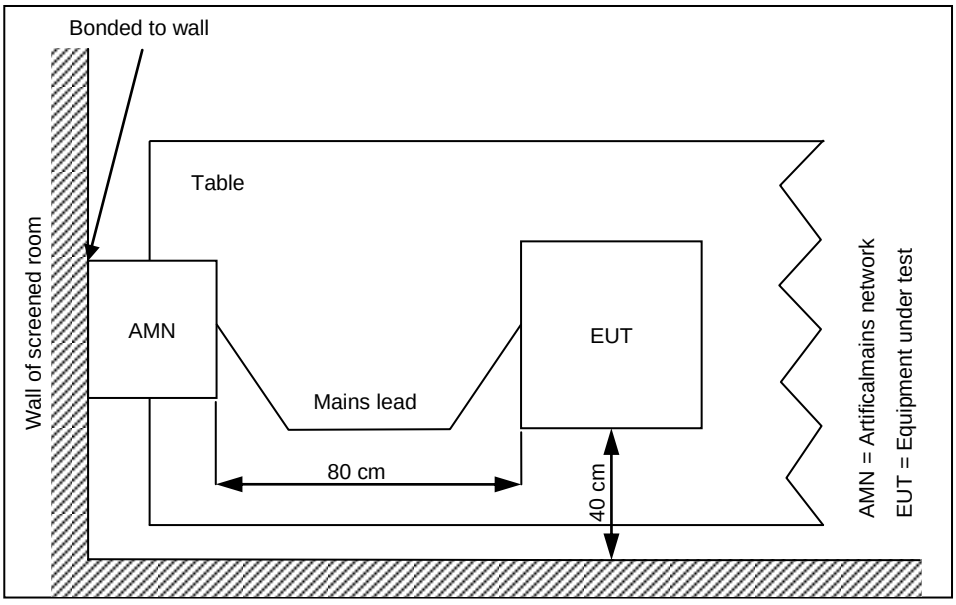
List with correction factors:

Frequency [MHz]	CF [dB]	VC [dB]
0,150	9,80	1,42
1,000	9,80	0,41
5,000	9,90	0,32
10,000	9,90	0,23
15,000	10,00	0,39
20,000	10,00	1,19
25,000	10,20	1,55
30,000	10,30	1,31

Example calculation:
For example at 10,000 000 MHz the measured Voltage (UR) is 37,62 dBµV, the loss of the cable and filter (CF) is 9,90 dB and the correction factor of the ISN (VC) is 0,23 dB the final result will be calculated:
SS [dBµV] = 37,62 [dBµV] + 9,90 [dB] + 0,23 [dB] = 47,75 [dBµV] (244, 06 µV)

8.1.7 Test Set-up

According to EMC basic standard **ANSI 63.4**



8.2 Electromagnetic Radiated Emissions (Distance 10 m)

8.2.1 Instrumentation for Test (see equipment list)

F 1	F 2	F 4b	F 5	F 6	F 7	F 8	F 21				

8.2.2 Test Plan

EUT set-up	see test details		
Operating mode	**Application**	**Limit**	**Result**
see test details	Enclosure	FCC part 15 B Class B	passed

Remarks:	Powered by external power supply (115V / 60Hz)

8.2.3 Radiated Limits

Frequency- range	**FCC part 15 B Class B**	**FCC part 15 B Class A**
30 MHz – 88 MHz	30 dBµV/m	39,1 dBµV/m
88 MHz – 216 MHz	33,5 dBµV/m	43,5 dBµV/m
216 MHz – 960 MHz	36 dBµV/m	46,4 dBµV/m
960 MHz – 40000 MHz	44 dBµV/m	49,5 dBµV/m
	* This values are recalculated from the class B limits at 3 m antenna distance in §15.109 (g 2) of the FCC rules	.

8.2.4 Calibration Information

Device	**Serial number**	**ICT Number**	**Calibration valid until**	**Calibration interval**
ESCI 3 Receiver	100083/003	300003312	03/2013	12 month
Trilog Antenna	9163-295	300003787	05/2014	24 month
Remarks: System check of all relevant devices and the chamber (weekly)				

8.2.5 Test Results

set 11

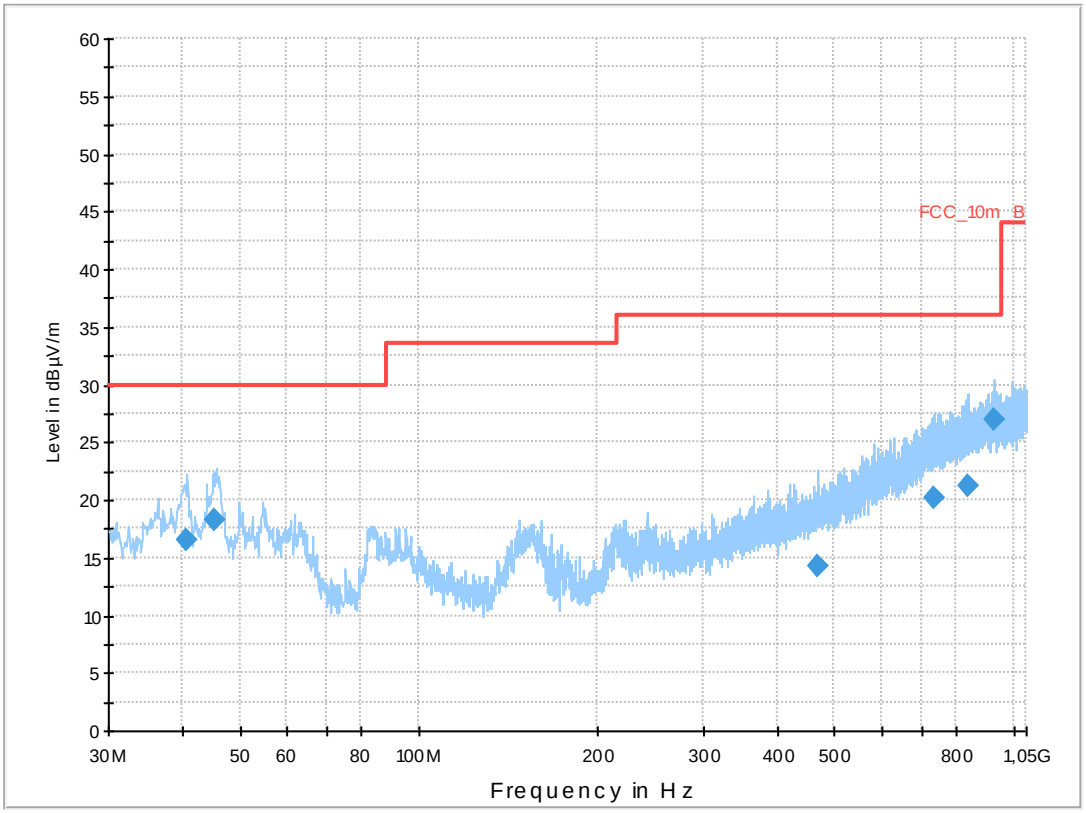
Common Information

EUT:	RFN81UW
Serial Number:	IMEI:004401139252122
Test Description:	FCC part 15 class B @ 10m
Operating Conditions:	GSM 850 idle + charging
Operator Name:	Medrow
Comment:	AC: 115 V / 60 Hz

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
40.701750	16.5	1000.0	120.000	98.0	V	268.0	13.4	13.5	30.0	
45.141000	18.2	1000.0	120.000	98.0	V	92.0	13.3	11.8	30.0	
467.609700	14.2	1000.0	120.000	170.0	V	88.0	18.0	21.8	36.0	
735.169500	20.1	1000.0	120.000	170.0	H	100.0	23.3	15.9	36.0	
837.493500	21.2	1000.0	120.000	98.0	H	266.0	24.4	14.8	36.0	
927.460800	26.9	1000.0	120.000	120.0	V	261.0	25.3	9.1	36.0	

set 12

Common Information

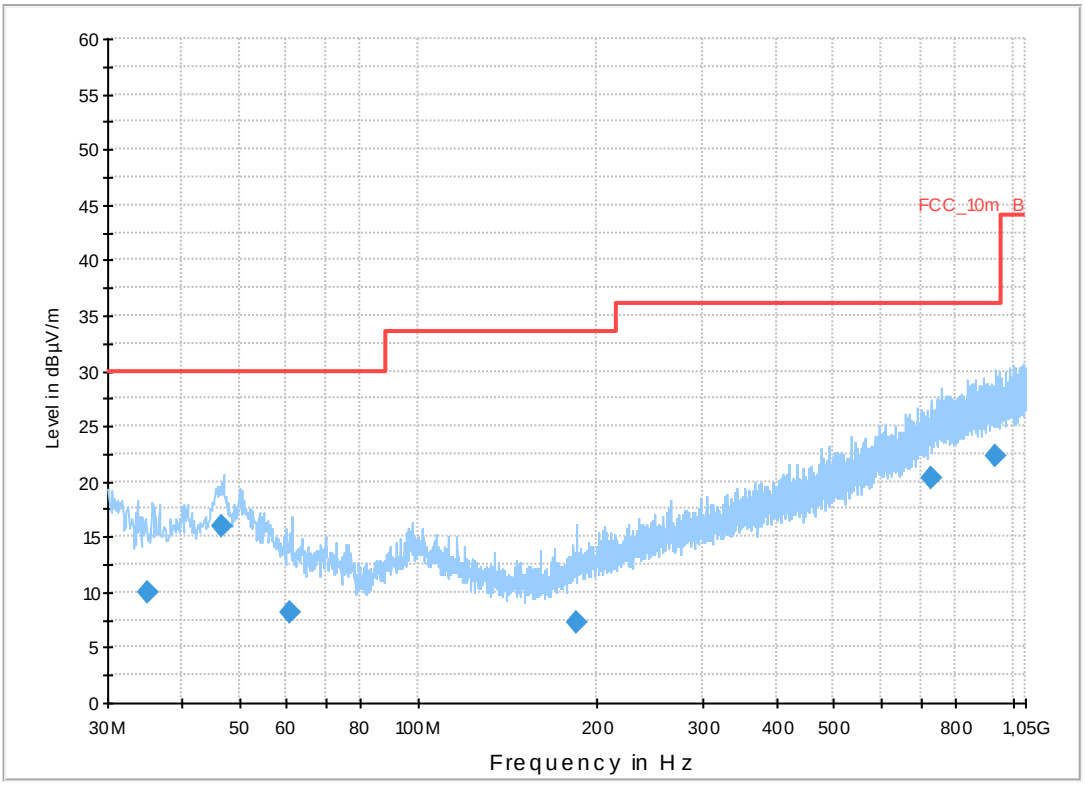
EUT:	RFN81UW
Serial Number:	IMEI:004401139252122
Test Description:	FCC part 15 B class B @ 10 m
Operating Conditions:	PCS1900 idle + charging
Operator Name:	Medrow
Comment:	AC: 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

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

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
0 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
35.092350	9.9	1000.0	120.000	121.0	H	268.0	13.0	20.1	30.0	
46.602300	16.0	1000.0	120.000	105.0	V	190.0	13.3	14.0	30.0	
60.732600	8.2	1000.0	120.000	170.0	H	90.0	11.4	21.8	30.0	
184.514100	7.3	1000.0	120.000	170.0	V	100.0	10.7	26.2	33.5	
726.797100	20.3	1000.0	120.000	105.0	H	182.0	23.1	15.7	36.0	
937.402350	22.3	1000.0	120.000	170.0	H	89.0	25.3	13.7	36.0	

set 13

Common Information

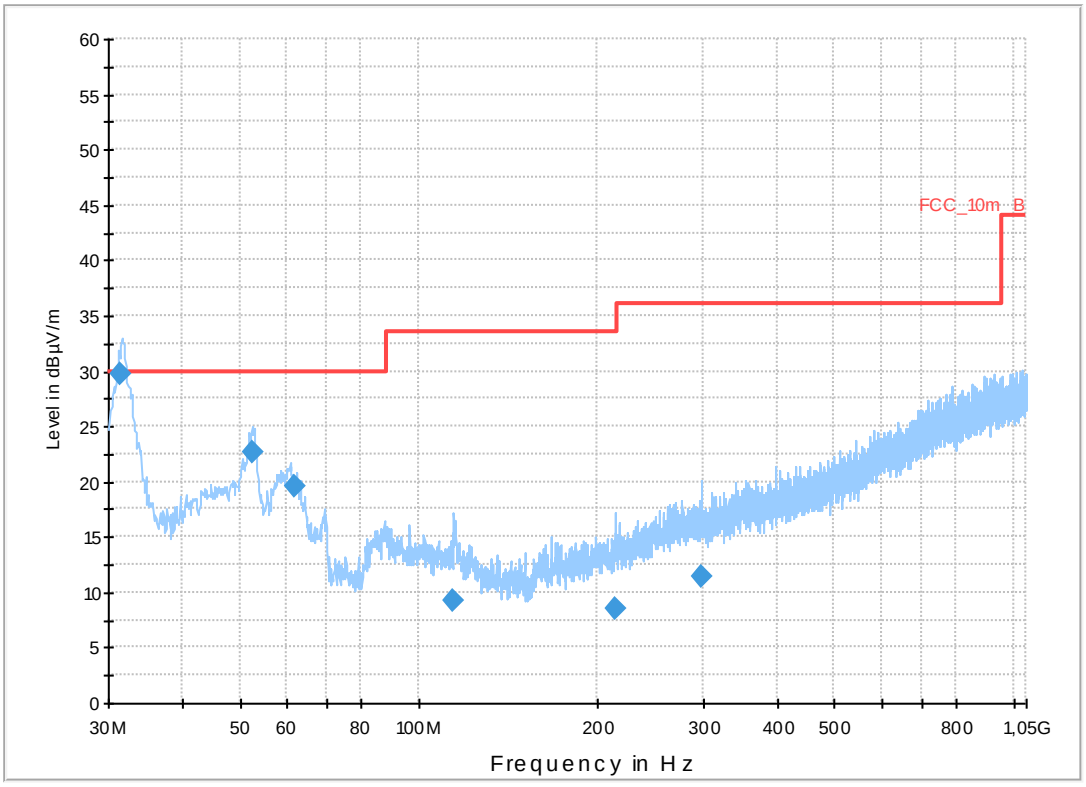
EUT:	RFN81UW
Serial Number:	IMEI:004401139252122
Test Description:	FCC part 15 B class B @ 10 m
Operating Conditions:	UMTS FDD2 idle + charging
Operator Name:	Medrow
Comment:	AC: 115 V / 60 Hz

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
31.436250	29.7	1000.0	120.000	98.0	V	280.0	12.7	0.3	30.0	
52.374450	22.6	1000.0	120.000	104.0	V	190.0	13.1	7.4	30.0	
61.540650	19.6	1000.0	120.000	171.0	V	90.0	11.2	10.4	30.0	
113.807700	9.2	1000.0	120.000	171.0	V	280.0	10.7	24.3	33.5	
213.832350	8.5	1000.0	120.000	143.0	V	100.0	12.2	25.0	33.5	
297.974550	11.5	1000.0	120.000	113.0	V	100.0	14.5	24.5	36.0	

set 15

Common Information

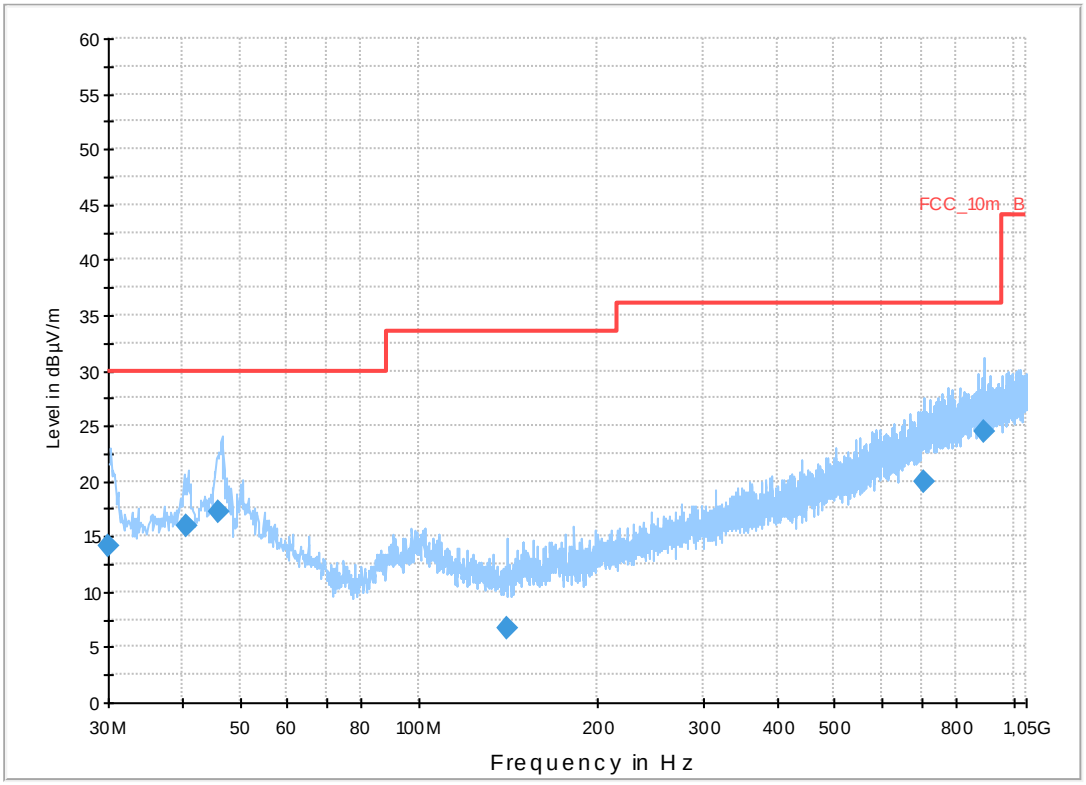
EUT:	RFN81UW
Serial Number:	IMEI:004401139252122
Test Description:	FCC part 15 B class B @ 10m
Operating Conditions:	UMTS FDD 5 idle + charging
Operator Name:	Medrow
Comment:	AC: 115 V / 60 Hz

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
30.066583	14.2	1000.0	120.000	98.0	V	88.0	12.5	15.8	30.0	
40.733250	16.0	1000.0	120.000	105.0	V	273.0	13.4	14.0	30.0	
46.038150	17.2	1000.0	120.000	98.0	V	93.0	13.3	12.8	30.0	
140.267700	6.7	1000.0	120.000	170.0	V	180.0	8.7	26.8	33.5	
705.335250	19.9	1000.0	120.000	133.0	V	175.0	22.6	16.1	36.0	
891.121200	24.4	1000.0	120.000	111.0	H	-2.0	25.1	11.6	36.0	

set 16

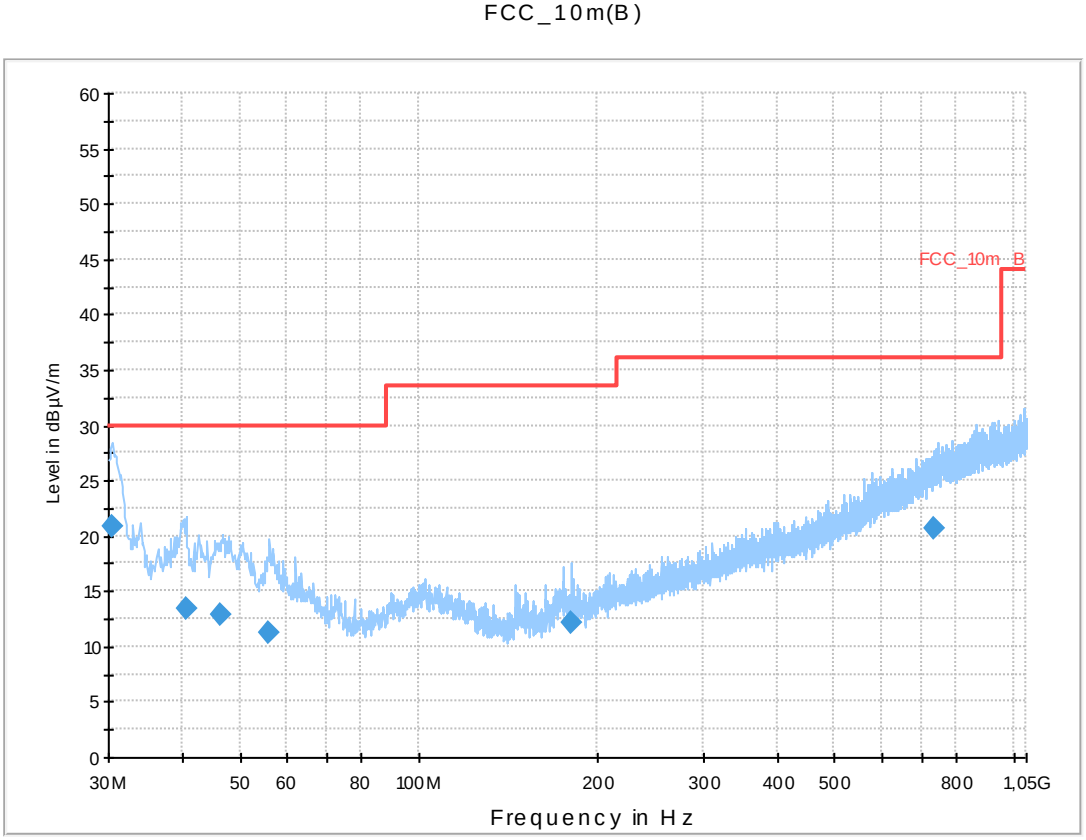
Common Information

EUT:	RFN81UW
Serial Number:	IMEI:004401139252122
Test Description:	FCC part 15 B class B @ 10m
Operating Conditions:	UMTS FDD5 idle + charging
Operator Name:	Wolsdorfer
Comment:	AC: 115 V / 60 Hz

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
30.430402	20.9	1000.0	120.000	100.0	V	-6.0	12.5	9.1	30.0	
40.598100	13.4	1000.0	120.000	200.0	V	-19.0	13.4	16.6	30.0	
46.453050	12.9	1000.0	120.000	156.0	V	286.0	13.3	17.1	30.0	
56.029200	11.2	1000.0	120.000	255.0	V	176.0	12.6	18.8	30.0	
180.002550	12.1	1000.0	120.000	113.0	V	-30.0	10.4	21.4	33.5	
734.541000	20.7	1000.0	120.000	400.0	V	93.0	23.3	15.4	36.0	

set 17

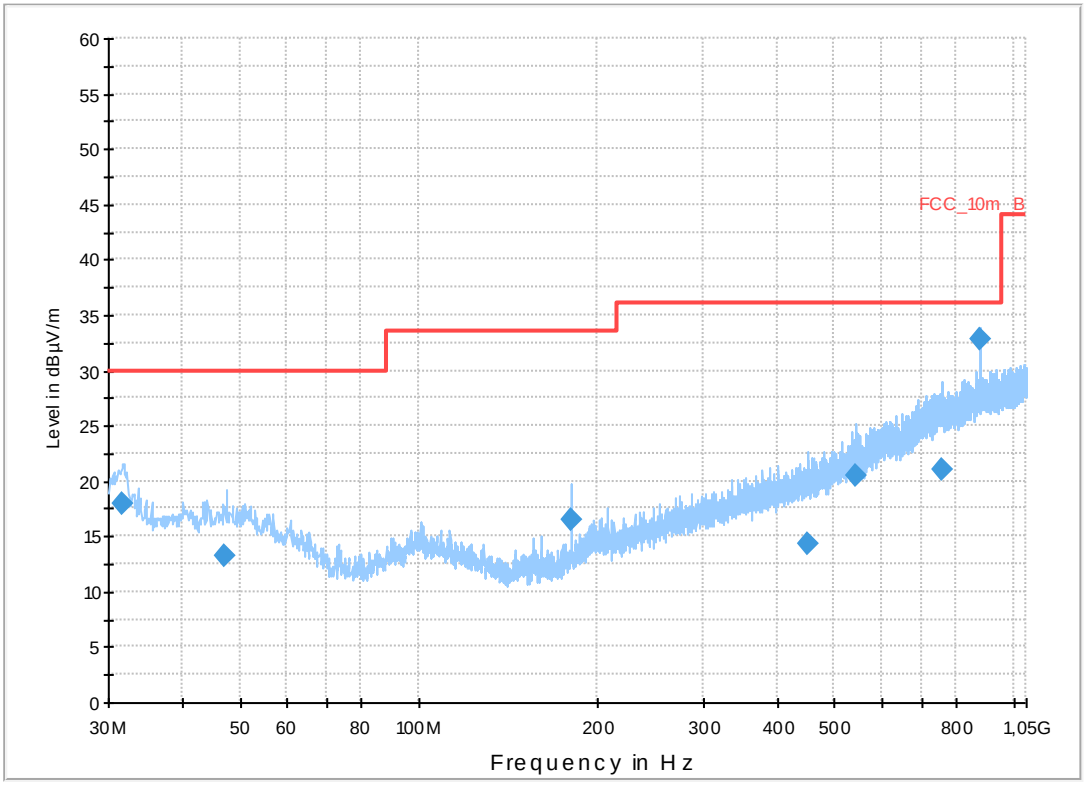
Common Information

EUT:	RFN81UW
Serial Number:	IMEI:004401139252122
Test Description:	FCC part 15 B class B @ 10 m
Operating Conditions:	GSM850 idle + charging
Operator Name:	Wolsdorfer
Comment:	AC: 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
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
31.618800	18.0	1000.0	120.000	100.0	V	153.0	12.7	12.0	30.0	
46.987650	13.2	1000.0	120.000	100.0	V	80.0	13.3	16.8	30.0	
179.986050	16.5	1000.0	120.000	100.0	V	139.0	10.4	17.0	33.5	
451.056900	14.3	1000.0	120.000	135.0	H	283.0	17.7	21.7	36.0	
544.027500	20.5	1000.0	120.000	346.0	H	256.0	19.3	15.5	36.0	
759.630450	21.0	1000.0	120.000	290.0	H	124.0	23.7	15.0	36.0	
875.925900	32.8	1000.0	120.000	123.0	H	309.0	24.9	3.2	36.0	

8.2.6 Hardware Set-up

Subrange 1

Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.42
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table (vertical): Cable_EN_1GHz (1005) Correction Table (horizontal): Cable_EN_1GHz (1005)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12
	EMC 32 Version 8.52

8.2.7 Signal strength calculation

Calculation formula:
$SS = U_R + CL + AF$

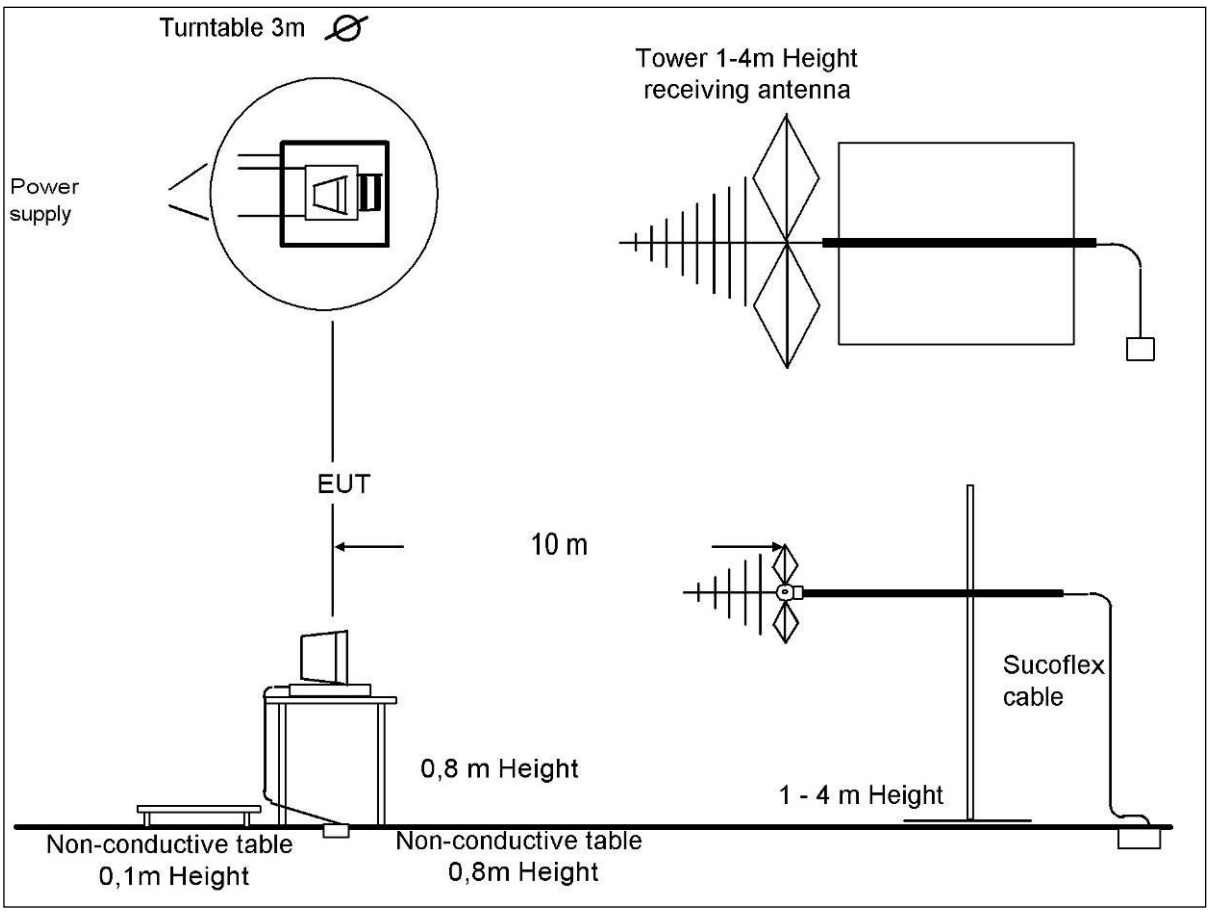
List of abbreviations:
SS ► signal strength
U_R ► voltage at the receiver
CL ► loss of the cable
AF ► antenna factor

List with correction factors:

Frequency [MHz]	CL [dB]	AF [dBµV/m]
30,000	0,20	12,30
100,000	0,60	11,30
200,000	1,10	10,60
300,000	1,30	13,20
400,000	1,60	15,30
500,000	1,90	16,80
600,000	2,00	18,80
700,000	2,20	20,30
800,000	2,30	21,50
900,000	2,40	22,80
1000,000	2,50	23,30

Example calculation:
For example at 500,000 000 MHz the measured Voltage (U_R) is 12,35 dBµV/m, the loss of the cable (CL) is 1,90 dB and the antenna factor (AF) is 16,80 dBµV/m the final result will be calculated:
SS [dBµV] = 12,35 [dBµV/m] + 1,90 [dB] + 16,80 [dBµV/m] = 31,05 [dBµV/m] (35,69 µV/m)

8.2.8 Test Set-up



8.3 Electromagnetic Radiated Emissions (Distance 5 m)

8.3.1 Instrumentation for Test (see equipment list)

F 1	F 6	F 29	F 30	F 33	F 21						

8.3.2 Test Plan

EUT set-up	see test details		
Operating mode	**Application**	**Limit**	**Result**
see test details	Enclosure	FCC part 15B class B	passed

Remarks:	The measured values are recalculated from 5m to 3m distance Powered by external power supply (115V / 60Hz)

8.3.3 Radiated Limits

Frequency- range	**47CFR15: (FCC part 15 B) Class B**	**47CFR15: (FCC part 15 B) Class A ***
30 MHz – 88 MHz	40 dBµV/m	49,1 dBµV/m
88 MHz – 216 MHz	43,5 dBµV/m	53,5 dBµV/m
216 MHz – 960 MHz	46 dBµV/m	56,4 dBµV/m
960 MHz – 18000 MHz	54 dBµV/m	59,5 dBµV/m
		* This values are recalculated from the class A limits at 10 m antenna distance in §15.109 (g 2) of the FCC rules.

8.3.4 Calibration Information

Device	**Serial number**	**ICT Number**	**Calibration valid until**	**Calibration interval**
ESU 26	100037	300003555	01/2014	12 month
Horn Antenna	9120B188	300003896	04/2014	24 month
Remarks: System check of all relevant devices and the chamber (weekly)				

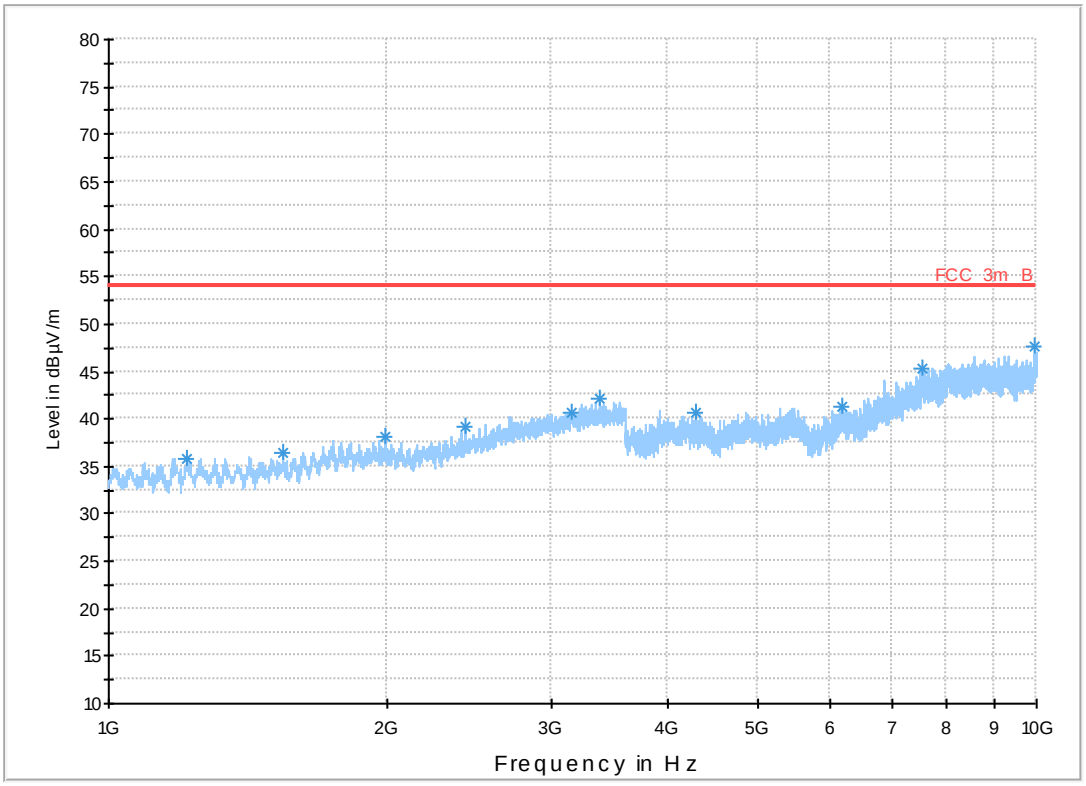
8.3.5 Test Results

set 11

Common Information

EUT:	RFN81UW
Serial Number:	IMEI:004401139252122
Test Description:	FCC part 15 B class B @ 5 m
Operating Conditions:	GSM 850 idle + charging
Operator Name:	Medrow

FCC_1_10_B_5m



Data Reduction Result 1 [1]

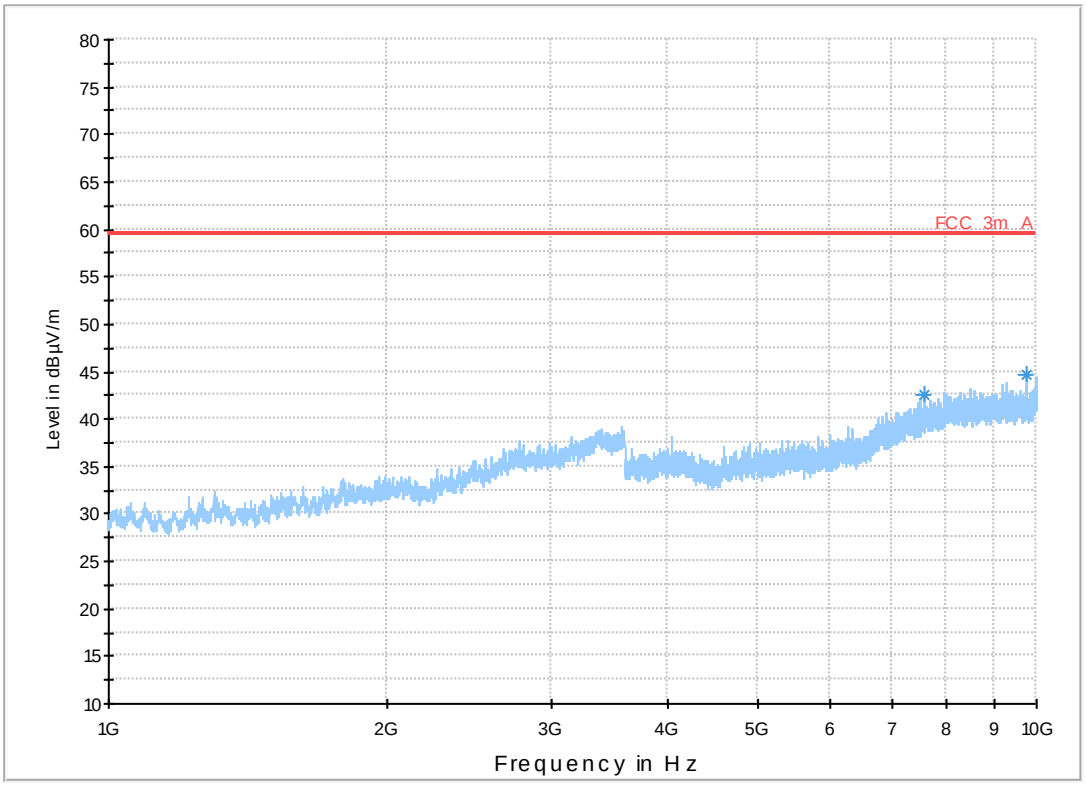
Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Height (cm)	Polarization	Azimuth	Corr. (dB)	Comment
1215.100000	35.8	100.0	V	234.0	-6.5	
1541.800000	36.5	100.0	H	303.0	-5.5	
1989.100000	38.1	100.0	H	228.0	-3.6	
2422.900000	39.1	100.0	V	1.0	-2.3	
3154.600000	40.7	100.0	V	145.0	0.2	
3379.600000	42.1	100.0	V	259.0	0.6	
4292.200000	40.7	100.0	V	94.0	1.7	
6175.000000	41.3	100.0	V	348.0	4.6	
7525.000000	45.4	100.0	H	184.0	7.9	
9974.800000	47.7	100.0	V	69.0	9.7	

set 12

Common Information

EUT:	RFN81UW
Serial Number:	IMEI:004401139252122
Test Description:	FCC part 15 B class B
Operating Conditions:	PCS1900 idle+charging
Operator Name:	Medrow
Comment:	AC: 115 V / 60 Hz

FCC_1_10_A_5m



Data Reduction Result 1 [1]

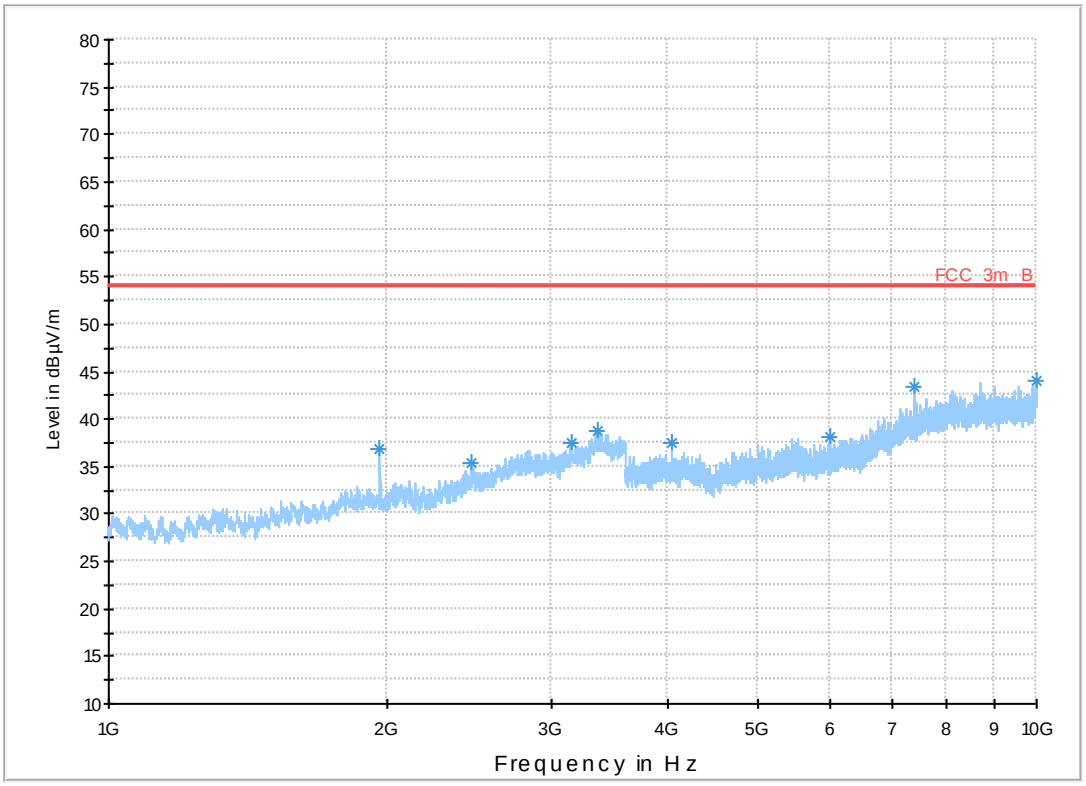
Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Height	Polarization	Azimuth	Corr. (dB)	Comment
7564.600000	42.5	100.0	H	228.0	8.0	
9737.200000	44.6	100.0	H	128.0	9.6	

set 13

Common Information

EUT:	RFN81UW
Serial Number:	IMEI:004401139252122
Test Description:	FCC part 15 B class B
Operating Conditions:	UMTS FDD 2 idle + charging
Operator Name:	Medrow
Comment:	AC: 115 V / 60 Hz

FCC_1_10_B_5m



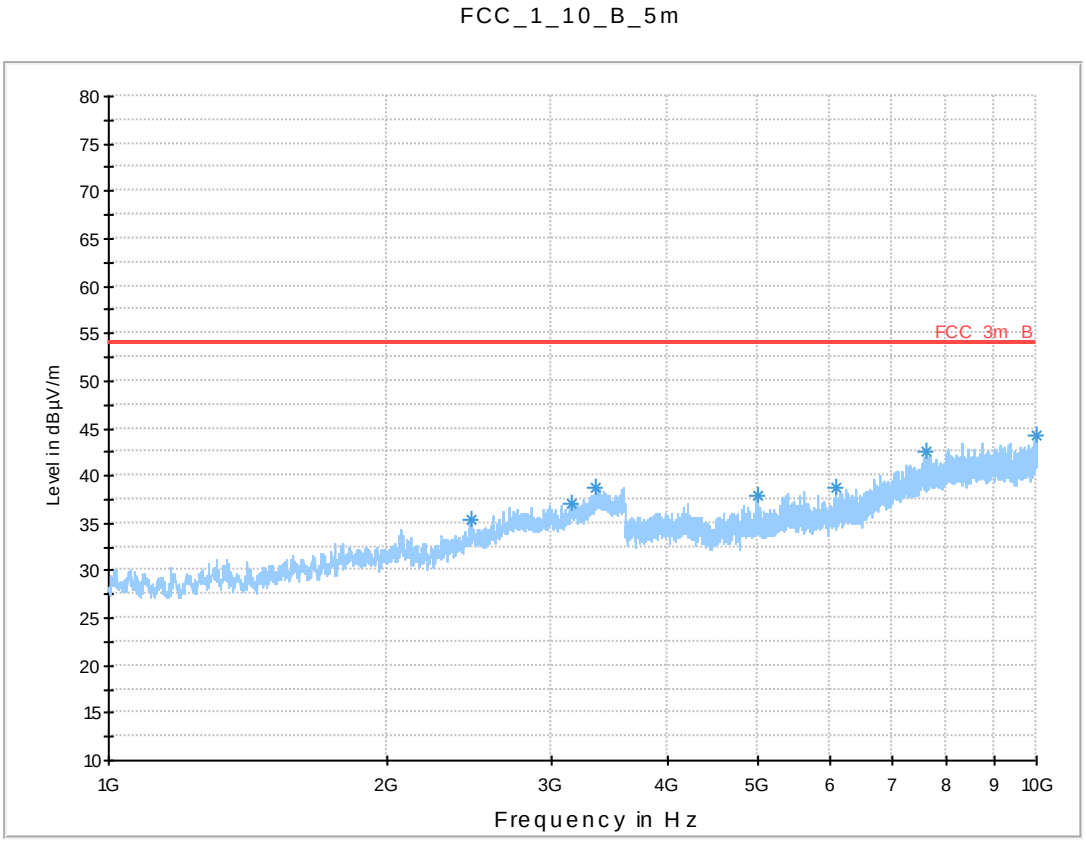
Data Reduction Result 1 [1]

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Height	Polarization	Azimuth	Corr. (dB)	Comment
1959.400000	36.8	100.0	H	208.0	-3.7	
2459.800000	35.5	100.0	V	239.0	-2.2	
3156.400000	37.5	100.0	V	174.0	0.2	
3372.400000	38.8	100.0	V	12.0	0.6	
4040.200000	37.4	100.0	V	180.0	1.7	
5986.900000	38.1	100.0	H	22.0	4.3	
7381.900000	43.3	100.0	V	28.0	7.6	
9993.700000	44.0	100.0	H	328.0	9.8	

set 15

Common Information

EUT:	RFN81UW
Serial Number:	IMEI:004401139252122
Test Description:	FCC part 15 B class B
Operating Conditions:	UMTS FDD 5 idle + charging
Operator Name:	Medrow
Comment	AC: 115 V / 60 Hz



Data Reduction Result 1 [1]

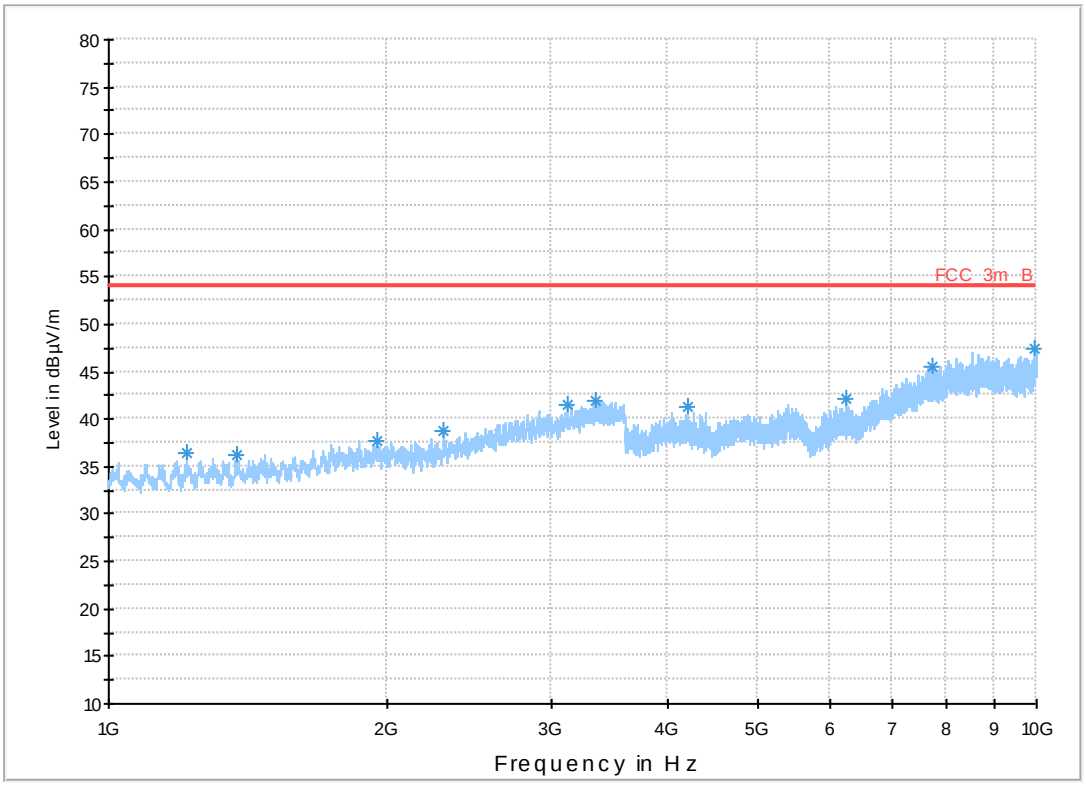
Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Height	Polarization	Azimuth	Corr. (dB)	Comment
2457.100000	35.3	100.0	V	114.0	-2.2	
3160.900000	37.0	100.0	H	159.0	0.2	
3343.600000	38.7	100.0	H	302.0	0.5	
5004.100000	37.9	100.0	H	95.0	2.6	
6082.300000	38.8	100.0	V	62.0	4.4	
7615.900000	42.6	100.0	V	120.0	8.0	
9990.100000	44.2	100.0	V	243.0	9.8	

set 16

Common Information

EUT:	RFN81UW
Serial Number:	IMEI:004401139252122
Test Description:	FCC part 15 B class B @ 10 m
Operating Conditions:	UMTS FDD5 idle + charging
Operator Name:	Wolsdorfer
Comment:	AC: 115 V / 60 Hz

FCC_1_10_B_5m



Data Reduction Result 1 [1]

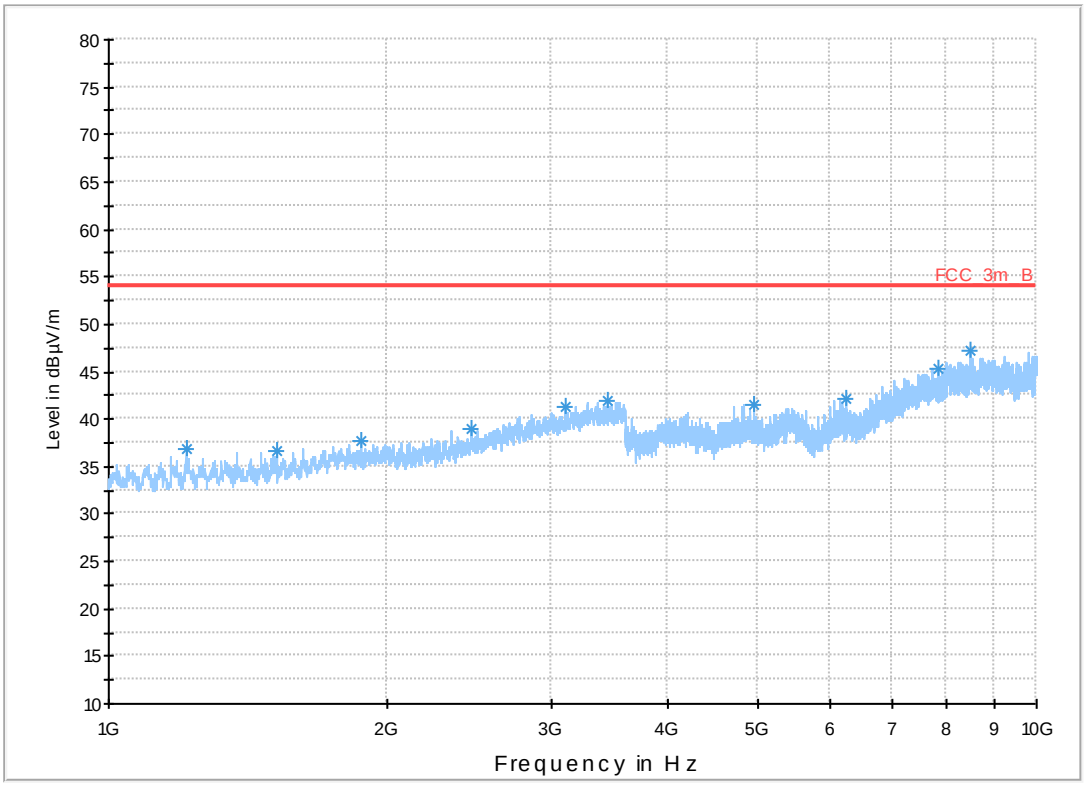
Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Height (cm)	Polarization	Azimuth	Corr. (dB)	Comment
1215.100000	36.4	100.0	V	0.0	-6.5	
1371.700000	36.3	100.0	H	286.0	-6.1	
1945.900000	37.8	100.0	V	86.0	-3.7	
2299.600000	38.7	100.0	H	261.0	-2.6	
3120.400000	41.5	100.0	H	248.0	0.1	
3340.900000	41.9	100.0	V	92.0	0.5	
4203.100000	41.4	100.0	H	46.0	1.7	
6224.500000	42.2	100.0	H	204.0	4.7	
7721.200000	45.5	100.0	V	250.0	8.2	
9966.700000	47.4	100.0	V	98.0	9.7	

set 17

Common Information

EUT:	RFN81UW
Serial Number:	IMEI:004401139252122
Test Description:	FCC part 15 B class B @ 5 m
Operating Conditions:	GSM850 idle + charging
Operator Name:	Wolsdorfer
Comment:	AC: 115 V / 60 Hz

FCC_1_10_B_5m



Data Reduction Result 1 [1]

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Height (cm)	Polarization	Azimuth	Corr. (dB)	Comment
1211.500000	36.9	100.0	H	164.0	-6.5	
1517.500000	36.6	100.0	V	266.0	-5.7	
1872.100000	37.7	100.0	H	330.0	-4.0	
2463.400000	39.1	100.0	H	114.0	-2.2	
3106.000000	41.3	100.0	H	298.0	0.1	
3455.200000	42.0	100.0	V	253.0	0.7	
4958.200000	41.5	100.0	H	29.0	2.5	
6238.000000	42.1	100.0	V	217.0	4.7	
7824.700000	45.3	100.0	H	0.0	8.4	
8479.000000	47.2	100.0	H	298.0	8.9	

8.3.6 Hardware Set-up

Subrange 1	
Frequency Range:	1 GHz - 10 GHz
Receiver:	ESU [ESU 26] @ GPIB0 (ADR 17), SN 100037/026, FW 4.43
Signal Path:	1_6_EN FW 1.0 Correction Table: 3_5m Correction Table: LNA_EN (matix)
Antenna:	BBHA 9120 B Correction Table (vertical): BBHA9120 Correction Table (horizontal): BBHA9120 Correction Table (vertical): Cable_Horn_EN (1103) Correction Table (horizontal): Cable_Horn_EN (1103)
Antenna Tower:	Generic Tripod [Generic Tripod] @ GPIB0 (ADR 19), SN ?
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

8.3.7 Signal strength calculation

Calculation formula:
$SS = U_R + CL + AF + PA + DC$

List of abbreviations:

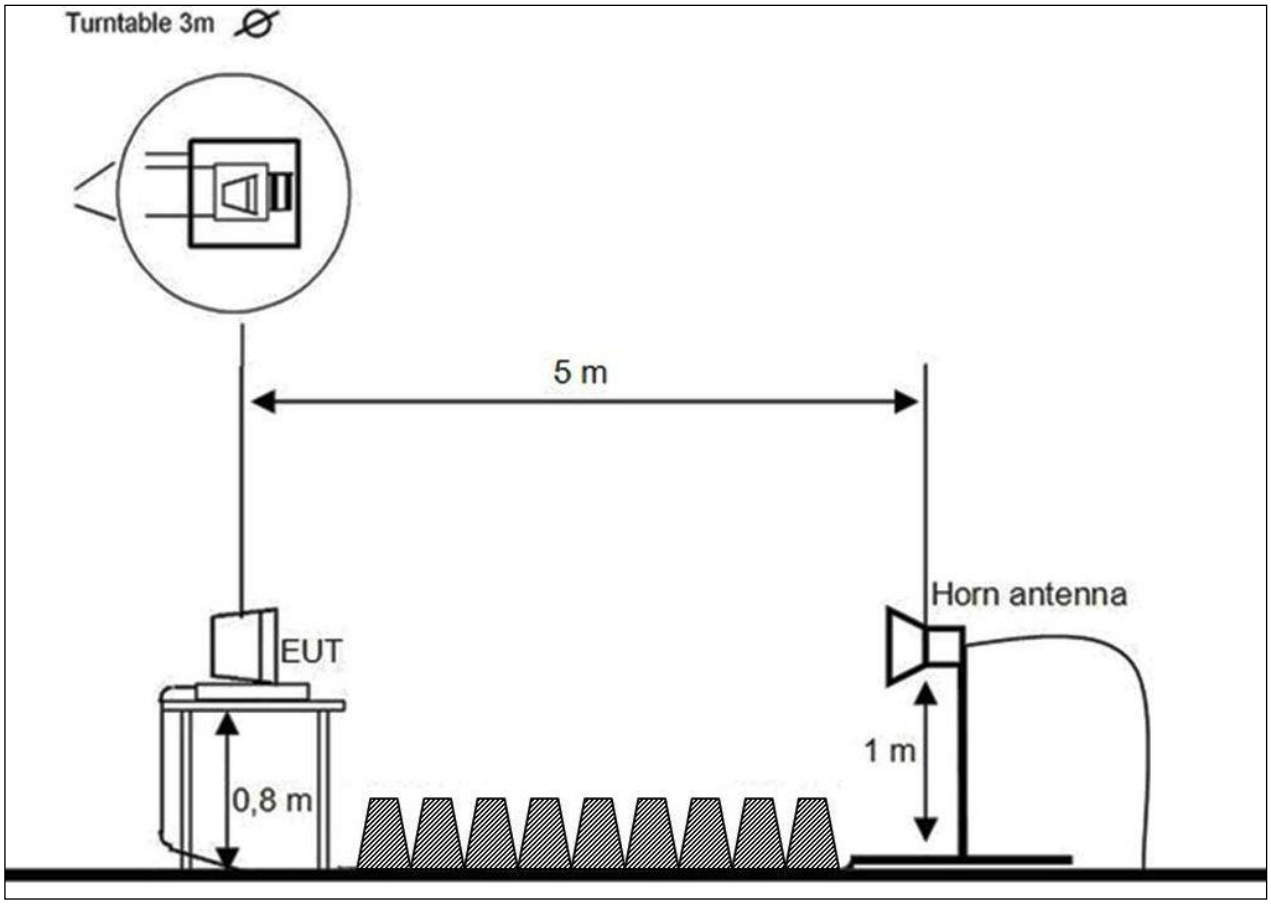
SS	►	signal strength
U_R	►	voltage at the receiver
CL	►	loss of the cable and gain of the preamp
AF	►	antenna factor
DC	►	distance correction (results measured on 5 m calculated to 3 m)

List with correction factors:

Frequency [GHz]	CL [dB]	AF [dBµV/m]	DC [dB]
1,000	-35,50	26,20	4,40
1,500	-35,20	26,10	4,40
2,000	-35,10	26,70	4,40
2,500	-35,00	26,50	4,40
3,000	-34,70	27,60	4,40
3,500	-34,80	28,40	4,40
4,000	-35,00	28,60	4,40
4,500	-34,90	28,90	4,40
5,000	-34,80	29,30	4,40
5,500	-34,35	29,80	4,40
6,000	-34,00	30,30	4,40
6,500	-33,50	31,20	4,40
7,000	-33,10	31,20	4,40
7,500	-33,40	31,70	4,40
8,000	-33,80	32,10	4,40
8,500	-33,75	32,30	4,40
9,000	-33,70	31,70	4,40
9,500	-33,50	29,40	4,40
10,000	-33,40	33,00	4,40

Example calculation:
For example at 4,000 000 000 GHz the measured Voltage (U_R) is 46,13 dBµV/m, the loss of the cable (CL) is -35,00 dB, the antenna factor (AF) is 28,60 dBµV/m and the distance correction (DC) is 4,40 dB the final result will be calculated:
SS [dBµV] = 46,13 [dBµV/m] + (-35,00) [dB] + 28,60 [dBµV/m] + 4,4 [dB] = 44,13 [dBµV/m] (160,88 µV/m)

8.3.8 Test Set-up



9 Test equipment and ancillaries used for tests

To simplify the identification of the test equipment and/or ancillaries which were used, the reporting of the relevant test cases only refer to the test item number as specified in the table below.

No.	Instrument/Ancillary	Manufacturer	Type	Serial-No.	Internal identification
	Radiated emission in chamber F				
F-1	Control Computer	F+W		FW0502032	300003303
F-2	Trilog-Antenna	Schwarzbeck	VULB 9163	9163-295	---
F-3a	Amplifier	Veritech Microwave Inc.	0518C-138	- / -	- / -
F-4b	Switch	HP	3488A	- / -	300000368
F-5	EMI Test receiver	R&S	ESCI	100083	300003312
F-6	Turntable Interface-Box	EMCO / ETS-LINDGREN	Model 105637	44583	300003747
F-7	Tower/Turntable Controller	EMCO / ETS-LINDGREN	Model 2090	64672	300003746
F-8	Tower	EMCO / ETS-LINDGREN	Model 2175	64762	300003745
F-9	Ultra Notch-Filter Rejected band Ch. 62	WRCD		9	
	Radiated immunity in chamber F				
F-10	Control Computer	F+W		FW0502032	300003303
F-11	Signal Generator	HP	8665A	2833A00112	300001373
F-12	RF-Amplifier	ar	100W1000 M1	12951	300000529
F-13	Directional Coupler	ar	DC 3010	12708	300001428
F-14	Stacked Logper Antenna	Schwarzbeck	STLP9128 E	9128 E 013	300003408
F-15	RF-Amplifier	ar	60S1G3	313649	300003410
F-15b	RF-Amplifier 0.8 – 4 GHz	BONN	BLMA 0840-2000/100D	076820B	300003783
F-16	Directional Coupler	ar	DC7144A	312786	300003411
F-17	Horn Antenna	ar	AT 4002	19739	300000633
F-18	Power Meter	R&S	NRV	860327/024	F033
F-19	Power sensor	R&S	URV5-Z2	839080/005	300002844.02
F-20	Power sensor	R&S	URV5-Z2	830755/057	F032
	Harmonics and flicker in front of chamber F				
F-21	Flicker and Harmonics Test System	Spitzenberger & Spies	PHE4500/B I PHE4500/B II	B5983 B5984	300000210
F-28	Power Supply	Hewlett Packard	6032 A	2920 A 04466	300000580
	Radiated emission in chamber F > 1GHz				
F-29	Horn antenna	Schwarzbeck	BBHA 9120 B	9120B188	300003896
F-30	Amplifier	ProNova	0518C-138	005	F 024
F-31	Amplifier	Miteq	42-00502650-28-5A	1103782	300003379
F-32	Horn antenna	Emco	3115	9709-5289	300000213
F-33	Spectrum Analyzer	R&S	ESU26	100037	300003555
F-34	Loop antenna	EMCO	6502	8905-2342	300000256

No.	Instrument/Ancillary	Manufacturer	Type	Serial-No.	Internal identification
	Conducted emission in chamber G				
G-1	EMI Receiver	Hewlett Packard	8542 E	3617A00170	300000568
G-2	V-ISN	Rohde & Schwarz	ESH 3-Z5	892475/017	300002209
G-2a	V-ISN	Rohde & Schwarz	ESH 2-Z5	892602/024	300000587
G-3	2-Wire ISN	Schaffner	ISN T200	19075	300003422
G-4	4-Wire ISN	Schaffner	ISN T400	22325	300003423
G-5	Shielded wire ISN	Schaffner	ISN ST08	22583	300003433
G-6	Unshielded 8 wire ISN	Teseq	ISN T800	26113	300003833
G-7	Unshielded 8 wire ISN	Teseq	ISN T8-Cat. 6	26374	300003851
G-8	RF Current probe	FCC	F-33-4	46	300003257
G-9	V-ISN	Schaffner	ISN PLC-150	21579	300003318
G-10	V-ISN	Schaffner	ISN PLC-25-30	21584	300003319
G 10a	PLC Filter	TESEQ	Filter PLC	23436	300003598
G 10b	Coupling unit 75 Ohm	Fiedler	AC	----	300003272.04
	Conducted immunity in chamber G				
G-11	Signal generator	R&S	SMG	8610647025	300000204.01
G-12	RF-Amplifier	BONN	BSA 0125-75	066502-01	300003545
G-13	Power Meter	R&S	URV 5	837723/025	300002844.01
G-14	Power Sensor	R&S	URV 5-Z2	832874/021	300002239
G-15	Directional coupler	emv	DC 2000	9401-1677	300000592
G-16	Attenuator 6dB	Alan	50HP6-100 N	121048 0348	300003148
G-17	EM-Injection Clamp	FCC	203i	232	300000626
G-18	CDN	FCC	FCC-801-M3-16	237	300000627
G-19	CDN	FCC	FCC-801-T2	78	300000629
G-20	CDN	FCC	FCC-801-AF 2	62	300000630
G-21	CDN	FCC	FCC-801-AF 4	61	300000631
G-22	CDN	FCC	FCC-801-M1	2027	300002761
G-23	CDN	Lüthi	CDN 801-M2/M3	9350105	300000534
G-24	Transformator for 50Hz Loop Antenna	EM-Test	MC2630	0200-10	300002659.01
G-25	50Hz Loop Antenna	EM-Test	MS 100	none	300002659
	Surge, Burst, Dips and Interruptions in chamber G				
G-26	Hybrid-Generator	EM-Test	UCS 500N5	V112711033	300004257
G-27	Motor Variac	EM-Test	MV 2616	0600-01	300002658
G-28	Capacitive Coupling Clamp	MWB	KKS 100	---	300000589
G-29a	Coupling Decoupling Network	EMC-Partner	CDN-2000-06-32	158	300004108
G-29	Coupling Decoupling Network	EMC-Partner	CDN-UTP	00014	300003226
	ESD in chamber G				
G-30	ESD generator	Schaffner	NSG 435	308	300002249
	Emission on bench in chamber G				
G-31	Absorbing Clamp	R&S	MDS-21	832 231/006	300000527
	generic in chamber G				
G-32	power supply	Hewlett Packard	6038A	2848A06673	300001512

10 Observations

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

Annex A: Photographs of the test set-up

see document 1-5579_12-01-12_Annex_A

Annex B: Photographs of the EUT

see document 1-5579_12-01-12_Annex_A

Annex C: Document history

Version	Applied changes	Date of release
-/-	Initial release	2013-03-04

Annex D: Further information

Glossary

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