



EUROFINS ETS PRODUCT SERVICE GMBH

TEST - REPORT

**FCC RULES PARTS 15.247
IC RADIO STANDARDS RSS-210 Annex 8**

FCC ID: V98-BWLC-V1

**Model Name:
WLAN Client**

Test report no.:G0M20804-1727-C-1



Certificate #1983.01



Eurofins ETS Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde
Germany

Phone +49-33631-888 0
Fax +49-33631-888 660

TABLE OF CONTENTS

1	General information	2
1.1	Notes	3
1.2	Testing laboratory	3
1.3	Details of approval holder	3
1.4	Application details	4
1.5	Test item	4
1.6	Test standards	6
2	Technical test	6
2.1	Summary of test results	6
2.2	Test environment	6
2.3	Test equipment utilized	7
2.4	Test Procedure	8
3	Test Results	9
3.1	Peak Output Power	10
3.2	Radiated Power	12
3.3	Minimum 6 dB Bandwidth	13
3.4	Peak Power Spectral Density	15
3.5	Spurious Emissions conducted	16
3.6	Spurious Emissions radiated	17
3.7	Conducted Emission at (AC) Power Line	20
4	Receiver parameters	21
4.1	Radiated emission	21
ANNEX		23

1 General information

1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.

The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.

Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification.

Neither is there any guarantee that such a test sample will interwork with other genuinely open systems.

The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.5.

The test report may only be reproduced or published in full.

Reproduction or publication of extracts from the report requires the prior written approval of the Eurofins ETS Produkt Service GmbH.

Operator:

20.05.2008

M. Schlaps



Date

ETS-Lab.

Name

Signature

Technical responsibility for area of testing:

20.05.2008

K. Damm



Date

ETS

Name

Signature

1.2 Testing laboratory

1.2.1 Location

Eurofins ETS Product ServiceGmbH
Storkower Straße 38c
D-15526 Reichenwalde b. Berlin
Germany
Telephone : +49 33631 888 00
Telefax : +49 33631 888 660

1.2.2 Details of accreditation status

DAR ACCREDITED TESTING LABORATORY

DAR-REGISTRATION NUMBER: DAT-P-268/08

RECOGNIZED NOTIFIED BODY EMC

REGISTRATION NUMBER: BNetzA-bS EMV-07/61

RECOGNIZED NOTIFIED BODY R&TTE

REGISTRATION NUMBER: BNetzA-bS-02/51-53

FCC FILED TEST LABORATORY

REG.-No. 96970

A2LA ACCREDITED TESTING LABORATORY

CERTIFICATE NO. 1983.01

BLUETOOTH QUALIFICATION TEST FACILITY (BQTF)

ACCREDITED BY BLUETOOTH QUALIFICATION REVIEW BOARD

INDUSTRY CANADA FILED TEST LABORATORY

REG. No. IC 3470

1.3 Details of approval holder

Name	:	modas GmbH
Street	:	Belziger Str. 69-71
Town	:	10823 Berlin
Country	:	Germany
Telephone	:	+49 30 230973 37
Fax	:	+49 30 230973 22
Contact	:	Herr Günter Rohgengel
E-Mail	:	+49 30 230973 37

1.4 Application details

Date of receipt of application : 11.04.2008
Date of receipt of test item : 11.04.2008
Date of test : 11.04.2008 – 19.05.2008

1.5 Test item

Description of test item : WLAN Client
Type identification : BWLC
Hardware version : 1.0
Software version : 1.0
Serial number : without
Photos : See annex A.

Technical data

Frequency band : 2.4 GHz – 2.4835 GHz
Frequency (ch A) : 2412 MHz
Frequency (ch B) : 2437 MHz
Frequency (ch C) : 2462 MHz
Number of Channels : 11
Operating Modes : duplex
Type of modulation : DSSS, OFDM

Data Rate (Mbps)	Modulation	Support
1	DSSS	<input checked="" type="checkbox"/>
6	OFDM	<input checked="" type="checkbox"/>

Fixed point-to-point operation: Yes / No

Power supply : 5.0 V DC (120 V AC/DC Adapter)
Antenna type : 2 x IF Panel Antenna
Antenna gain : 0 dBi
Host device : none

Classification :

Fixed Device	<input type="checkbox"/>
Mobile Device (Human Body distance > 20cm)	<input checked="" type="checkbox"/>
Portable Device (Human Body distance < 20cm)	<input type="checkbox"/>

DSSS 1 Mbps

Transmitter	<u>Unom</u>	<u>Umin</u>	<u>Umax</u>
Power (ch A)	: Conducted: 19.86 dBm	Conducted: 19.89 dBm	Conducted: 19.86 dBm
Power (ch B)	: Conducted: 22.38 dBm	Conducted: 22.44 dBm	Conducted: 22.42 dBm
Power (ch C)	: Conducted: 19.25 dBm	Conducted: 19.22 dBm	Conducted: 19.24 dBm

OFDM 6 Mbps

Transmitter	<u>Unom</u>	<u>Umin</u>	<u>Umax</u>
Power (ch A)	: Conducted: 22.59 dBm	Conducted: 22.61 dBm	Conducted: 22.59 dBm
Power (ch B)	: Conducted: 22.36 dBm	Conducted: 22.36 dBm	Conducted: 22.37 dBm
Power (ch C)	: Conducted: 21.88 dBm	Conducted: 21.88 dBm	Conducted: 21.88 dBm

Manufacturer:
(if applicable)

Name : modas GmbH
Street : Belziger Str. 69-71
Town : 10823 Berlin
Country : Germany

Additional information: The sample is using WLAN technology according IEEE 802.11 b/g. The scheme for frequency generation, spectrum spreading, receiver parameters, synchronization procedure, and other parameters are determined by the mentioned standard above.

1.6 Test standards

Technical standard : FCC Parts: 15.247
IC Standards: RSS 210 Issue 7 Annex 8.2

2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

or

The deviations as specified in 2.5 were ascertained in the course of the tests performed.

2.2 Test environment

Temperature	: 25°C
Relative humidity content	: 20 ... 75 %
Air pressure	: 86 ... 103 kPa
Details of power supply	: 5.0 V DC 120 V AC/DC Adapter
Extrem conditions parameters:	: test voltage - extreme min.: 4.5 V AC max: 5.5 V AC

Extreme test voltages were declared by manufacturer.

2.3 Test equipment utilized

No.	Test equipment	Type	Manufacturer
ETS 0012	Biconical Antenna	HK 116	R & S
ETS 0013	LPD Antenna	HL 223	R & S
ETS 0014	Log Periodical Antenna	HL 025	R & S
ETS 0015	Log Periodical Antenna	HL 025	R & S
ETS 0018	Horn antenna	BBHA 9120 D	Schwarzbeck
ETS 0253	Spectrum Analyzer	FSIQ 26	R & S
ETS 0271	Spectrum Analyzer	FSEK 30	R & S
ETS 0288	Artificial mains	ESH2-Z5	R & S
ETS 0294	Biconical antenna	HK 116	R & S
ETS 0295	LPD antenna	HL 223	R & S
ETS 0310	Anechoic chamber	AC 3	Frankonia
ETS 0311	Anechoic chamber	AC 4	Frankonia
ETS 0416	Power Supply	EX752M	TTi
ETS 0474	EMI Test Receiver	ESCS 30	R&S
ETS 0484	Radio Communication Tester	CMU 200	R&S

2.4 General test procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-2003 5.2 using a 50 μ H LISN (if necessary). Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-2003 6.4 using a spectrum analyzer. The resolution bandwidth of the spectrum analyzer was 100 kHz for measurements below 1 GHz and RBW 1 MHz was used above 1 GHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

FORMULA OF CONVERSION FACTORS for Field strength: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dB μ V) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB.

Example:

Freq. (MHz)	METER READING + ACF + CABLE LOSS (to the receiver) = FS
33	20 dB μ V + 10.36 dB + 6 dB = 36.36 dB μ V/m @3m

ANSI STANDARD C63.4-2003 6.2.1 MEASUREMENT PROCEDURES: The UUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table). The UUT was placed in the center of the table. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to at least 10th harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes and the highest readings.

Measurements were made by Eurofins ETS Product Service GmbH at the registered open field test site located at Storkower Str. 38c, 15526 Reichenwalde, Germany.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

ANTENNA & GROUND:

This unit use 2 x IF Panel Antenna.

2.5 Test results

 1st test

 test after modification

 production test

SECT.	TEST CASE	FCC 47CFR PART	IC RSS-	Required	Test passed	Test failed
3	<i>TRANSMITTER PARAMETERS</i>					
3.1	RF power output conducted	15.247 (b)(3)	210 A8.4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3.2	RF power output radiated (EIRP)	15.247 (b)(3)	210 A8.4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	6 dB bandwidth	15.247 (a)(2)	210 A8.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3.4	Peak power spectral density	15.247 (e)	210 A8.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3.5	Spurious emission conducted	15.247 (d)	210 A8.5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6	Spurious emission radiated	15.247 (d)	210 A8.5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3.7	AC power line conducted emissions	15.207	Gen 7.2.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	<i>RECEIVER PARAMETERS</i>					
4.1	Radiated emissions	-	Gen 7.2.3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3 Transmitter parameters

3.1 RF power output, conducted

Reference

FCC	47 CFR part 15.247 (b)
IC	RSS-210 A 8.4

Method of measurement

This measurement applies to equipment with an integral antenna and to equipment with an antenna connector and equipped with an antenna as declared by the applicant.

The power was measured with modulation (declared by the applicant).

Limits

FCC	1 Watt (30dBm)
IC	1 Watt (30dBm)

Test results

Test conditions	Channel A	Channel B	Channel C
DSSS	[dBm]	[dBm]	[dBm]
$T_{\text{nom}} = 25^\circ \text{C}$ $V_{\text{nom}} = 5.0 \text{ V}$	19.86	22.38	19.25
$T_{\text{nom}} = 25^\circ \text{C}$ $V_{\text{min}} = 4.5 \text{ V}$	19.89	22.44	19.22
$T_{\text{nom}} = 25^\circ \text{C}$ $V_{\text{max}} = 5.5 \text{ V}$	19.86	22.42	19.24
Measurement uncertainty	< 3 dB		

Test conditions	Channel A	Channel B	Channel C
OFDM	[dBm]	[dBm]	[dBm]
$T_{\text{nom}} = 25^\circ\text{C}$ $V_{\text{nom}} = 5.0\text{ V}$	22.59	22.36	21.88
$T_{\text{nom}} = 25^\circ\text{C}$ $V_{\text{min}} = 4.5\text{ V}$	22.61	22.36	21.88
$T_{\text{nom}} = 25^\circ\text{C}$ $V_{\text{max}} = 5.5\text{ V}$	22.59	22.37	21.88
Measurement uncertainty	< 3 dB		

Test equipment: ETS 0253, ETS 0271

3.2 RF power output, radiated,

Reference

FCC	CFR part 15.247 (b)(3)
IC	RSS-210 A8.4

Method of measurement

This measurement applies to equipment with an integral antenna and to equipment with an antenna connector and equipped with an antenna as declared by the applicant.

The power was measured with modulation (declared by the applicant).

Limits

FCC	1 Watt (30dBm)
IC	1 Watt (30dBm)

Test Results

Test conditions	Channel A	Channel B	Channel C
	EIRP [dBm]	EIRP [dBm]	EIRP [dBm]
$T_{\text{nom}} = 25^{\circ}\text{C}$ $V_{\text{nom}} = 5.0\text{ V}$	--	--	--
Measurement uncertainty	< 3 dB		

Not required.

Test equipment:

ETS 0012, ETS, 0013, ETS, 0015, ETS 0018, ETS 0253, ETS 0271, ETS 0311

3.3 6 dB bandwidth

Reference

FCC	CFR part 15.247 (a)(2)
IC	RSS-210 A8.2

Method of measurement

Spectrum analyser:

RBW: 100 kHz

Span: > RBW

Limits

FCC	$BW_{6dB} \geq 500 \text{ kHz}$
IC	$BW_{6dB} \geq 500 \text{ kHz}$

Test results

Test conditions	Channel A	Channel B	Channel C
DSSS	BW [MHz]	BW [MHz]	BW [MHz]
$T_{nom} = 25^\circ \text{C}$ $V_{nom} = 5.0 \text{ V}$	12.17	12.12	12.57
Measurement uncertainty	< 10 Hz		

Test conditions	Channel A	Channel B	Channel C
OFDM	BW [MHz]	BW [MHz]	BW [MHz]
$T_{nom} = 25^\circ \text{C}$ $V_{nom} = 5.0 \text{ V}$	16.43	16.33	16.38
Measurement uncertainty	< 10 Hz		

System receiver input bandwidth:

The manufacturer declares that the receiver input bandwidth matches to the bandwidth of the transmitter signal.

Occupied Bandwidth (99%) – RSS Gen

Test conditions	Channel A	Channel B	Channel C
DSSS	BW [MHz]	BW [MHz]	BW [MHz]
$T_{\text{nom}} = 25^\circ\text{C}$ $V_{\text{nom}} = 5.0\text{ V}$	15.43	15.63	15.63
Measurement uncertainty	< 10 Hz		

Test conditions	Channel A	Channel B	Channel C
OFDM	BW [MHz]	BW [MHz]	BW [MHz]
$T_{\text{nom}} = 25^\circ\text{C}$ $V_{\text{nom}} = 5.0\text{ V}$	17.43	17.43	17.43
Measurement uncertainty	< 10 Hz		

See attached diagrams

Test equipment: ETS 0271

3.4 Peak power spectral density

Reference

FCC	CFR part 15.247 (e)
IC	RSS-210 A8.2

Method of measurement

The same method of determining the conducted output power shall be used to determine the power spectral density.

Limits

FCC	≤ 8 dBm in any 3kHz band
IC	≤ 8 dBm in any 3kHz band

Test results

Test conditions	Spectral density		
	Channel A [dBm]	Channel B [dBm]	Channel C [dBm]
DSSS $T_{\text{nom}} = 25^\circ\text{C}$ $V_{\text{nom}} = 5.0\text{ V}$	-5.87	-5.36	-6.36
Measurement uncertainty	< 3 dBs		

Test conditions	Spectral density		
	Channel A [dBm]	Channel B [dBm]	Channel C [dBm]
OFDM $T_{\text{nom}} = 25^\circ\text{C}$ $V_{\text{nom}} = 5.0\text{ V}$	-11.76	-10.34	-12.43
Measurement uncertainty	< 3 dBs		

Test equipment: ETS 0271

3.5 Spurious emission conducted

Reference

FCC	CFR part 15.247 (d)
IC	RSS-210 A8.5

Method of measurement

The EUT is connected to the spectrum analyzer via a low loss cable. If the EUT is not equipped with an antenna connector, a temporary antenna connector has to be installed. The EUT is switched on, the hopping function is disabled.

The analyzer setting was as following:

Frequency range	RES bandwidth		Video bandwidth	
	Pk	Avg	Pk	Avg
f < 1GHz	100 kHz	-	100 kHz	-
f > 1GHz	1 MHz	1 MHz	1 MHz	1MHz

Limits

FCC	20 dB below peak output power
IC	20 dB below peak output power

Test results

Frequency	Result [dBm]	Limit [dBm]	Margin [dB]	Reference level [dBm]
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--

Comment: Not required.

3.6 Spurious emission radiated

Reference

FCC	CFR part 15.247(d), 15.205. 15.209, 15.35
IC	RSS-210 A8.5

Method of measurement

Spurious emission was measured with modulation (declared by manufacturer).

According to 47 CFR 15, Part 15.247 (d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in 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 15.205(c)).

Sample Calculation of Limit:

All results are updated by an automatic measuring system in accordance to point 2.3

Calculation of test results:

Such factors like antenna correction, cable loss, external attenuation etc. are already included in the provided measurement results.

The peak and average spurious emission plots was measured with the average limits.

In the Table being listed the critical peak and average value an exhibit the compliance with the above calculated Limits.

If in the column's correction factor states a value then the max. Field strength in the same row is corrected by a value gained from the "Marker-Delta-Method" or the „Duty-Cycle Correction Factor“.

15.35 (c) average value

When the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds.

Duty cycle correction = $20 \log (\text{dwell time} / \text{pulse-train time of 100 ms or less})$

The radiated emission measurements were performed from 30 MHz to 26000 MHz.

The analyzer setting was as following:

Frequency range	RES bandwidth		Video bandwidth	
	Pk	Avg	Pk	Avg
f < 1GHz	100 kHz	-	100 kHz	-
f > 1GHz	1 MHz	1 MHz	1 MHz	1MHz

FCC	20 dB below peak output power, emmissions which fall in the restricted bands (15.205(a)) must comply the following limits:														
	Frequencies below 1GHz: Frequency of emission [MHz] Field strength [μ V / m] Field strength [$\text{dB}\mu\text{V} / \text{m}$] <table> <tr> <td>30 – 88</td> <td>100</td> <td>40.0</td> </tr> <tr> <td>88 – 216</td> <td>150</td> <td>43.5</td> </tr> <tr> <td>216 – 960</td> <td>200</td> <td>46.0</td> </tr> <tr> <td>Above 960</td> <td>500</td> <td>54.0</td> </tr> </table> For frequencies above 1 GHz (Avg measurements): 54.0 $\text{dB}\mu\text{V} / \text{m}$ For frequencies above 1 GHz (Pk measurements): Limit + 20 dB = 54.0 $\text{dB}\mu\text{V} / \text{m}$ + 20 dB = 74 $\text{dB}\mu\text{V} / \text{m}$				30 – 88	100	40.0	88 – 216	150	43.5	216 – 960	200	46.0	Above 960	500
30 – 88	100	40.0													
88 – 216	150	43.5													
216 – 960	200	46.0													
Above 960	500	54.0													
IC	20 dB below peak output power, emmissions which fall in the restricted bands of table 1 (RSS-210 §2.7)must also comply with limits specified in tables 2 and 3														

Test results

Summary table with radiated data of the test plots DSSS 1 Mbps antenna 1

Freq.	Used Ch.	Frequency Marker [GHz]	Polarization	Δ corrections dB	Max. Field Strength [$\text{dB}\mu\text{V/m}$]	Compliance Limit [$\text{dB}\mu\text{V/m}$]	Detector	BW [MHz]	Margin [dB]
4	H	4.922	V		57.87	74	P	1	-16.13
4	H	4.924	V		45.97	54	AV	1	-8.03
4	H	4.922	H		56.47	74	P	1	-17.53
4	H	4.924	H		43.32	54	AV	1	-10.68
4	M	4.874	H		55.64	74	P	1	-18.36
4	M	4.874	H		46.25	54	AV	1	-7.75
4	M	4.874	V		58.18	74	P	1	-15.82
4	M	4.874	V		47.62	54	AV	1	-6.38
4	L	4.826	V		56.08	74	P	1	-17.92
4	L	4.824	V		43.97	54	AV	1	-10.03

Summary table with radiated data of the test plots DSSS 1 Mbps antenna 2

Freq.	Used Ch.	Frequency Marker [GHz]	Polarization	Δ corrections dB	Max. Field Strength [dB μ V/m]	Compliance Limit [dB μ V/m]	Detector	BW [MHz]	Margin [dB]
4	M	4.874	V		54.38	74	P	1	-19.62
4	M	4.874	V		43.77	54	AV	1	-10.23
4	M	4.874	H		58.03	74	P	1	-15.97
4	M	4.874	H		44.15	54	AV	1	-9.85

Summary table with radiated data of the test plots OFDM 6 Mbps antenna 1

Freq.	Used Ch.	Frequency Marker [GHz]	Polarization	Δ corrections dB	Max. Field Strength [dB μ V/m]	Compliance Limit [dB μ V/m]	Detector	BW [MHz]	Margin [dB]
3	L	2.389	V		64.95	74	P	1	-9.05
3	L	2.390	V		45.26	54	AV	1	-8.74
3	L	2.389	H		66.65	74	P	1	-7.35
3	L	2.390	H		46.39	54	AV	1	-7.61
3	H	2.486	V		56.37	74	P	1	-17.63
3	H	2.489	V		34.96	54	AV	1	-17.04
3	H	2.487	H		54.96	74	P	1	-19.04
3	H	2.501	H		35.14	54	AV	1	-18.86
4	H	4.992	V		57.02	74	P	1	-16.98
4	H	4.923	V		40.54	54	AV	1	-13.46
4	H	4.992	H		54.58	74	P	1	-19.42
4	H	4.923	H		38.02	54	AV	1	-15.98
4	M	4.874	H		54.85	74	P	1	-19.15
4	M	4.873	H		37.74	54	AV	1	-16.26
4	M	4.874	V		56.44	74	P	1	-17.56
4	M	7.311	V		57.00	74	P	1	-17.00
4	M	4.873	V		40.19	54	AV	1	-13.81
4	M	7.311	V		39.99	54	AV	1	-14.01
4	L	7.250	V		54.5	74	P	1	-19.50
4	L	7.239	V		39.57	54	AV	1	-14.43

Summary table with radiated data of the test plots OFDM 6 Mbps antenna 2

Freq.	Used Ch.	Frequency Marker [GHz]	Polarization	Δ corrections dB	Max. Field Strength [dBµV/m]	Compliance Limit [dBµV/m]	Detector	BW [MHz]	Margin [dB]
3	M	2.372	H		55.08	74	P	1	-18.92
3	M	2.375	H		38.46	54	AV	1	-15.54
4	M	4.874	H		54.38	74	P	1	-19.62
4	M	4.874	H		36.54	54	AV	1	-17.46
4	M	7.311	V		54.60	74	P	1	-19.40
4	M	7.309	V		39.51	54	AV	1	-14.49

Freq. – Frequency Range:

1:	30	–	200 MHz
2:	200	–	1000 MHz
3:	1	–	4 GHz
4:	4	–	8 GHz
5:	8	–	12 GHz
6:	12	–	17 GHz
7:	17	–	26,5 GHz

All other not noted test plots do not contain significant test results in relation to the limits.

See attached diagrams.

Test equipment: ETS 0012, ETS 0013, ETS 0015, ETS 0018, ETS 0271, ETS 0253, ETS 0311

3.7 AC power line conducted emissions

Reference

FCC	CFR part 15.207
IC	RSS-Gen 7.2.2

Method of measurement

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

This measurement was transact first with instrumentation using an average and peak detector and a 10 kHz bandwidth. If the peak detector achieves a calculated level, the measurement is repeated by an instrumentation using a quasi-peak detector.

Limits

FCC & IC	Frequency of emission	Conducted limit field strength [dB μ V]	
	[MHz]	Quasi Peak	Avg
	0.15 - 0.5	66 to 56	56 - 46
	0.5 - 5	56	46
	5 - 30	60	50

Test results

Frequency	Level	
	Quasi-peak	Average
150 kHz	Lower limit line	Lower limit line

See attached diagrams

Test equipment: ETS 0288, ETS 0474

4 Receiver parameters

4.1 Radiated emissions

Reference

FCC	-
IC	RSS-Gen 7.2.3

Method of measurement

The compliance of the EUT Receiver with the Limits of spurious emissions was performed according to the radiated measurement method.

The spectrum analyzer RBW was set to 100 kHz for measurements below 100 kHz and 1.0 MHz above 1.0 GHz. The measurement results are evaluated according to the procedure described in section 2.5 of this test report.

Limits:

	Spurious frequency	Field strength
	MHz	microvolt/m at 3 meter
FCC & IC	30 - 88	100
	88 - 216	150
	216 - 960	200
	above 960	500

Test Results

	Frequency marker indication [MHz]	Antenna polarizatin	Worst case emission level [μ V/m]	Compliance limit [μ V/M]	Results
	33.778	V	45.13	100	<u>-54.87</u>
	192.633	H	22.78	150	<u>-127.22</u>
	900.444	V	51.82	200	<u>-148.18</u>
	900.444	H	38.55	200	<u>-161.45</u>
	1803.000	V	130.32	500	<u>-369.68</u>
	3743.000	H	144.88	500	<u>-355.12</u>
	7693.000	V	134.74	500	<u>-365.26</u>
	7969.000	H	131.22	500	<u>-368.78</u>

See attached diagrams

Test equipment: ETS 0014, ETS 0294, ETS 0295, ETS 0310, ETS 0416, ETS 0484

Annex

A	Pictures	9 pages
B	RF power output conducted	12 pages
C	6 dB bandwidth	12 pages
D	Peak power spectral density	-- pages
E	Spurious emission radiated	175 pages
F	AC power line conducted emissions	2 pages
G	Receiver radiated emissions	28 pages