



FCC PART 15C TEST REPORT No.I14N01495-WLAN

for

ZTE CORPORATION

4G Wireless Router

Model Name: MF253M

FCC ID: SRQ-MF253M

with

Hardware Version: MF253M.H01

Software Version: EN_VIVO_BR_MF253MV1.0.0B05

Issued Date: 2015-01-30



Test Laboratory:

FCC 2.948 Listed: No.342690

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

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1. Test Laboratory

1.1. Testing Location

Location: CTTL(South Branch)

Address: No.12, ShangSha Innovation and Technology Park, Futian District,
Shenzhen, Guangdong, P. R. China 518048

1.2. Testing Environment

Normal Temperature: 15-35℃

Extreme Temperature: -20/+55℃

Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2014-12-15

Testing End Date: 2015-01-30

1.4. Signature

Xu Ye

(Prepared this test report)

Tang Weisheng

(Reviewed this test report)

Zhang Bojun

(Approved this test report)

2. Client Information

2.1. Applicant Information

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2.2. Manufacturer Information

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Country: China
Telephone: +86 18616587757
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3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	4G Wireless Router
Model Name	MF253M
Market Name	ZTE
RF Protocol	IEEE 802.11b/g/n20/n40
Operating Frequency	2412MHz~2462MHz
FCC ID	SRQ-MF253M

*Note: Photographs of EUT are shown in ANNEX A of this test report.

3.2. Internal Identification of EUT

EUT ID*	IMEI	HW Version	SW Version
EUT1	/	MF253M.H01	EN_VIVO_BR_MF253MV1.0.0B05

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE

AE ID*	Description	Type	SN
AE1	Charger	STC-A20120150C55-A	/

*AE ID: is used to identify the test sample in the lab internally.

4. Reference Documents

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	Oct, 2013 Edition
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2003
KDB558074	Measurement of Digital Transmission Systems Operating under Section 15.247	Jun, 2014
KDB 662911 D01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band	Sep,2012

5. Test Results

5.1. Summary of Test Results

No	Test cases	Standard Sub-clause	Verdict
0	Antenna Requirement	15.203	P
1	Maximum Peak Output Power	15.247 (b)	P
2	Peak Power Spectral Density	15.247 (e)	P
3	Occupied 6dB Bandwidth	15.247 (a)	P
4	Band Edges Compliance	15.247 (d)	P
5	Transmitter Spurious Emission - Conducted	15.247 (d)	P
6	Transmitter Spurious Emission - Radiated	15.247, 15.205, 15.209	P
7	AC Powerline Conducted Emission	15.107, 15.207	P

See **ANNEX B** and **ANNEX C** for details.

5.2. Statements

CTTL has evaluated the test cases requested by the applicant/manufacture as listed in section 5.1 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in section 4.2

5.3. Terms used in the result table

Terms used in Verdict column

P	Pass
NA	Not Available
F	Fail

Abbreviations

AC	Alternating Current
AFH	Adaptive Frequency Hopping
BW	Band Width
E.I.R.P.	equivalent isotropical radiated power
ISM	Industrial, Scientific and Medical
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
Tx	Transmitter

5.4. Laboratory Environment

Half-anechoic chamber (11.20 meters×6.10 meters×5.60 meters) did not exceed following limits:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2M Ω
Ground system resistance	< 0.5 Ω
Normalized Site Attenuation (NSA)	< ±3.5dB, with 3m of Measuring distance, 30MHz 1000MHz
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

Fully-anechoic chamber (11.20 meters×6.10 meters×6.60 meters) did not exceed following limits:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2M Ω
Ground system resistance	< 0.5 Ω
VSWR	Between 0 and 6 dB, from 30MHz to 18 000 MHz

Conduction Lab did not exceed following limits:

Temperature	Min.=15 °C, Max.=30 °C
Relative humidity	Min.=30 %, Max.= 60 %
Shielding effectiveness	> 80 dB
Electrical insulation	> 2M Ω
Ground system resistance	< 0.5 Ω

6. Test Facilities Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Vector Signal Analyzer	FSV40	100903	Rohde & Schwarz	2015-04-22	1 year

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Chamber	FACT5-2.0	4166	ETS-Lindgren	2016-05-29	3 years
2	Test Receiver	ESCI	100701	Rohde & Schwarz	2015-07-30	1 year
3	Spectrum Analyzer	FSP40	100378	Rohde & Schwarz	2015-12-19	1 year
4	BiLog Antenna	VULB9163	9163-329	Schwarzbeck	2017-01-20	3 years
5	Test Receiver	ESCI	100702	Rohde & Schwarz	2015-07-30	1 year
6	LISN	ESH2-Z5	100196	Rohde & Schwarz	2015-01-14	1 year
7	Signal Generator	SMR40	100541	Rohde & Schwarz	2015-12-25	1 year
8	Dual-Ridge Waveguide Horn Antenna	3117	00066577	ETS-Lindgren	2016-04-01	3 years
9	Loop Antenna	HLA6120	35779	TESEQ	2016-02-25	3 years
10	EMI Antenna	3160-09	00118383	ETS-Lindgren	2015-09-05	3 years

Anechoic chamber

Fully anechoic chamber by ETS-Lindgren.

ANNEX A: EUT photograph



Picture A-1: Mobile Phone



Picture A-2: Mobile Phone



Picture A-3: Charger



Picture A-4: Charger

ANNEX B: MEASUREMENT RESULTS FOR RECEIVER**B.0 Antenna requirement****Measurement Limit:**

Standard	Requirement
FCC CRF Part 15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, § 15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

Conclusion: The Directional gains of antenna used for transmitting is 2.5 dBi.**The RF transmitter uses an integrate antenna without connector.**

B.1 Maximum Average Output Power

Measurement Limit:

Standard	Limit (dBm)
FCC CRF Part 15.247(b)(1)	< 30

Measurement Results:

802.11b/g mode

Mode	Data Rate (Mbps)	Test Result (dBm)					
		2412MHz (Ch1)		2437MHz (Ch6)		2462 MHz (Ch11)	
802.11b	1	Fig.1	16.06	Fig.2	15.96	Fig.3	15.82
	2	Fig.4	15.78	Fig.5	15.68	Fig.6	15.47
	5.5	Fig.7	14.68	Fig.8	14.73	Fig.9	14.54
	11	Fig.10	13.52	Fig.11	13.69	Fig.12	13.47
802.11g	6	Fig.13	11.03	Fig.14	11.14	Fig.15	10.86
	9	Fig.16	10.35	Fig.17	10.44	Fig.18	10.19
	12	Fig.19	9.75	Fig.20	9.84	Fig.21	9.60
	18	Fig.22	8.76	Fig.23	8.86	Fig.24	8.65
	24	Fig.25	7.92	Fig.26	7.98	Fig.27	7.75
	36	Fig.28	6.56	Fig.29	6.67	Fig.30	6.50
	48	Fig.31	5.71	Fig.32	5.78	Fig.33	5.58
	54	Fig.34	5.27	Fig.35	5.34	Fig.36	5.25

802.11n mode

Mode	Data Rate (MCS Index)	Test Result (dBm)					
		2412MHz (Ch1)		2437MHz (Ch6)		2462 MHz (Ch11)	
802.11n (20MHz)	MCS0	Fig.37	10.82	Fig.38	10.99	Fig.39	10.88
	MCS1	Fig.40	9.55	Fig.41	9.61	Fig.42	9.52
	MCS2	Fig.43	8.55	Fig.44	8.70	Fig.45	8.61
	MCS3	Fig.46	7.75	Fig.47	7.90	Fig.48	7.79
	MCS4	Fig.49	6.52	Fig.50	6.61	Fig.51	6.74
	MCS5	Fig.52	5.65	Fig.53	5.79	Fig.54	5.74
	MCS6	Fig.55	5.42	Fig.56	5.57	Fig.57	5.51
	MCS7	Fig.58	5.06	Fig.59	5.28	Fig.60	4.60

Mode	Data Rate (MCS Index)	Test Result (dBm)					
		2422MHz (Ch3)		2437MHz (Ch6)		2452 MHz (Ch9)	
802.11n (40MHz)	MCS0	Fig.61	10.78	Fig.62	10.04	Fig.63	9.57
	MCS1	Fig.64	9.52	Fig.65	8.47	Fig.66	7.83
	MCS2	Fig.67	8.72	Fig.68	7.11	Fig.69	6.79
	MCS3	Fig.70	7.28	Fig.71	6.43	Fig.72	6.00
	MCS4	Fig.73	6.31	Fig.74	5.43	Fig.75	5.00
	MCS5	Fig.76	5.71	Fig.77	4.81	Fig.78	4.26
	MCS6	Fig.79	5.64	Fig.80	4.60	Fig.81	4.09
	MCS7	Fig.82	3.81	Fig.83	4.19	Fig.84	3.78

Mode	Data Rate (MCS Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11n (20MHz) MIMO	MCS8	8.81	8.39	7.85
	MCS9	6.99	6.81	6.33
	MCS10	5.97	5.81	5.28
	MCS11	5.34	5.16	4.62
	MCS12	4.33	4.15	3.80
	MCS13	3.80	3.92	3.22
	MCS14	3.69	3.38	2.94
	MCS15	3.42	3.22	2.76

Mode	Data Rate (MCS Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11n (40MHz) MIMO	MCS8	7.20	7.10	6.84
	MCS9	5.46	5.38	5.15
	MCS10	4.72	4.56	4.32
	MCS11	4.08	3.97	3.75
	MCS12	3.22	3.32	3.12
	MCS13	3.06	2.88	2.74
	MCS14	2.88	2.81	2.66
	MCS15	2.80	2.73	2.55

For MIMO mode, the total power is calculated with all antennas ($P_{Total} = P_{ant1} + P_{ant2}$).

See ANNEX C for test graphs.

Conclusion: PASS

B.2 Peak Power Spectral Density

Measurement Limit:

Standard	Limit
FCC CRF Part 15.247(d)	< 8 dBm/3 kHz

Measurement Results:

802.11b/g mode

Mode	Channel	Peak Power Spectral Density (dBm)		Conclusion
802.11b	1	Fig.85	-8.26	P
	6	Fig.86	-8.30	P
	11	Fig.87	-8.17	P
802.11g	1	Fig.88	-12.95	P
	6	Fig.89	-12.29	P
	11	Fig.90	-11.31	P

802.11n mode

Mode	Channel	Peak Power Spectral Density(dBm)		Conclusion
802.11n (20MHz)	1	Fig.91	-13.05	P
	6	Fig.92	-12.23	P
	11	Fig.93	-12.29	P
802.11n (40MHz)	3	Fig.94	-12.31	P
	6	Fig.95	-12.58	P
	9	Fig.96	-13.53	P

Mode	Channel	Peak Power Spectral Density(dBm)		Conclusion
802.11n (20MHz) Antenna 1	1	Fig.97	-13.73	P
	6	Fig.98	-13.12	P
	11	Fig.99	-13.29	P
802.11n (20MHz) Antenna 2	1	Fig.100	-16.95	P
	6	Fig.101	-18.38	P
	11	Fig.102	-19.20	P
802.11n (20MHz) MIMO	1	-12.04		P
	6	-11.99		P
	11	-12.30		P

Mode	Channel	Peak Power Spectral Density(dBm)		Conclusion
802.11n (40MHz) Antenna 1	3	Fig.103	-13.65	P
	6	Fig.104	-13.77	P
	9	Fig.105	-14.29	P
802.11n (40MHz) Antenna 2	3	Fig.106	-20.11	P
	6	Fig.107	-19.68	P
	9	Fig.108	-19.69	P
802.11n (40MHz) MIMO	3	-12.76		P
	6	-12.77		P
	9	-13.20		P

See ANNEX C for test graphs.

Conclusion: PASS

B.3 Occupied 6dB Bandwidth

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a)	≥ 500

Measurement Result:

802.11b/g mode

Mode	Channel	Test Results (kHz)		conclusion
802.11b	1	Fig.109	8466	P
	6	Fig.110	10159	P
	11	Fig.111	10159	P
802.11g	1	Fig.112	15586	P
	6	Fig.113	15543	P
	11	Fig.114	15456	P

802.11n mode

Mode	Channel	Test Results (kHz)		conclusion
802.11n (20MHz)	1	Fig.115	15630	P
	6	Fig.116	14935	P
	11	Fig.117	16107	P
802.11n (40MHz)	3	Fig.118	33690	P
	6	Fig.119	32171	P
	9	Fig.120	33408	P

See ANNEX C for test graphs.

Conclusion: PASS

B.4 Band Edges Compliance

Measurement Limit:

Standard	Limit (dBc)
FCC 47 CFR Part 15.247 (d)	> 20

Measurement Result:

802.11b/g mode

Mode	Channel	Test Results	Conclusion
802.11b	1	Fig.121	P
	11	Fig.122	P
802.11g	1	Fig.123	P
	11	Fig.124	P

802.11n mode

Mode	Channel	Test Results	Conclusion
802.11n (20MHz)	1	Fig.125	P
	11	Fig.126	P
802.11n (40MHz)	3	Fig.127	P
	9	Fig.128	P

See ANNEX C for test graphs.

Conclusion: PASS

B.5 Transmitter Spurious Emission

B.5.1 Transmitter Spurious Emission - Conducted

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d)	20dB below peak output power in 100 kHz bandwidth

Measurement Results:

802.11b/g mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11b	1	2.412 GHz	Fig.129	P
		30 MHz-3 GHz	Fig.130	P
		3GHz-18GHz	Fig.131	P
	6	2.437 GHz	Fig.132	P
		30 MHz-3 GHz	Fig.133	P
		3GHz-18GHz	Fig.134	P
	11	2.462 GHz	Fig.135	P
		30 MHz-3 GHz	Fig.136	P
		3GHz-18GHz	Fig.137	P
802.11g	1	2.412 GHz	Fig.138	P
		30 MHz-3 GHz	Fig.139	P
		3GHz-18GHz	Fig.140	P
	6	2.437 GHz	Fig.141	P
		30 MHz-3 GHz	Fig.142	P
		3GHz-18GHz	Fig.143	P
	11	2.462 GHz	Fig.144	P
		30 MHz-3 GHz	Fig.145	P
		3GHz-18GHz	Fig.146	P

802.11n mode

802.11n (20MHz)	1	2.412 GHz	Fig.147	P
		30 MHz-3 GHz	Fig.148	P
		3GHz-18GHz	Fig.149	P
	6	2.437 GHz	Fig.150	P
		30 MHz-3 GHz	Fig.151	P
		3GHz-18GHz	Fig.152	P
	11	2.462 GHz	Fig.153	P
		30 MHz-3 GHz	Fig.154	P
		3GHz-18GHz	Fig.155	P
802.11n (40MHz)	3	2.422 GHz	Fig.156	P
		30 MHz-3 GHz	Fig.157	P
		3GHz-18GHz	Fig.158	P
	6	2.437 GHz	Fig.159	P
		30 MHz-3 GHz	Fig.160	P
		3GHz-18GHz	Fig.161	P
	9	2.452 GHz	Fig.162	P
		30 MHz-3 GHz	Fig.163	P
		3GHz-18GHz	Fig.164	P
/	All channels	18GHz-26GHz	Fig.165	P

See ANNEX C for test graphs.

Conclusion: PASS

B.5.2 Transmitter Spurious Emission - Radiated**Measurement Limit:**

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output power

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)).

Limit in restricted band:

Frequency of emission (MHz)	Field strength(μ V/m)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Condition

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	120kHz/300kHz	5
1000-4000	1MHz/3MHz	15
4000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

Note:

According to the performance evaluation, the radiated emission margin of EUT is over 20dB in the band below 30MHz. Therefore, the measurement starts from 30MHz to tenth harmonic.

The measurement results include the horizontal polarization and vertical polarization measurements.

Measurement Results:
802.11b/g mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11b	1	30 MHz ~1 GHz	Fig.166	P
		1 GHz ~ 18 GHz	Fig.167	P
	6	30 MHz ~1 GHz	Fig.168	P
		1 GHz ~ 18 GHz	Fig.169	P
	11	30 MHz ~1 GHz	Fig.170	P
		1 GHz ~ 18 GHz	Fig.171	P
	Power(CH1)	2.38 GHz ~ 2.45 GHz	Fig.172	P
	Power(CH11)	2.45 GHz ~ 2.5 GHz	Fig.173	P
802.11g	1	30 MHz ~1 GHz	Fig.174	P
		1 GHz ~ 18 GHz	Fig.175	P
	6	30 MHz ~1 GHz	Fig.176	P
		1 GHz ~ 18 GHz	Fig.177	P
	11	30 MHz ~1 GHz	Fig.178	P
		1 GHz ~ 18 GHz	Fig.179	P
	Power(CH1)	2.38 GHz ~ 2.45 GHz	Fig.180	P
	Power(CH11)	2.45 GHz ~ 2.5 GHz	Fig.181	P

802.11n mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (20M)	1	30 MHz ~1 GHz	Fig.182	P
		1 GHz ~ 18 GHz	Fig.183	P
	6	30 MHz ~1 GHz	Fig.184	P
		1 GHz ~ 18 GHz	Fig.185	P
	11	30 MHz ~1 GHz	Fig.186	P
		1 GHz ~ 18 GHz	Fig.187	P
	Power(CH1)	2.38 GHz ~ 2.45 GHz	Fig.188	P
	Power(CH11)	2.45 GHz ~ 2.5 GHz	Fig.189	P
802.11n (40M)	3	30 MHz ~1 GHz	Fig.190	P
		1 GHz ~ 18 GHz	Fig.191	P
	6	30 MHz ~1 GHz	Fig.192	P
		1 GHz ~ 18 GHz	Fig.193	P
	9	30 MHz ~1 GHz	Fig.194	P
		1 GHz ~ 18 GHz	Fig.195	P
	Power(CH3)	2.38 GHz ~ 2.45 GHz	Fig.196	P
	Power(CH9)	2.45 GHz ~ 2.5 GHz	Fig.197	P
/	All channels	18 GHz~ 26.5 GHz	Fig.198	P

802.11b CH1 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
12149.000	60.4	V	17.9	13.6	74.0
13622.000	59.5	V	16.6	14.5	74.0
14142.000	59.8	V	16.2	14.2	74.0
14971.000	60.2	H	16.8	13.8	74.0
16329.000	59.9	V	16.7	14.1	74.0
16751.000	60.4	H	16.3	13.6	74.0

Frequency (MHz)	Average (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
4823.5000	48.3	V	15.4	5.7	54.0
9648.2500	47.5	H	17.9	6.5	54.0
10472.000	47.7	V	18.5	6.3	54.0
15057.000	47.5	H	16.2	6.5	54.0
16309.000	47.9	H	16.6	6.1	54.0
16826.000	48.2	H	16.7	5.8	54.0

802.11b CH 6(1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14213.000	61.3	H	16.5	12.7	74.0
15015.000	60.7	H	16.5	13.3	74.0
15735.000	61.6	H	16.3	12.4	74.0
16506.000	61.0	H	16.8	13.0	74.0
16717.000	61.8	H	16.2	12.2	74.0
17358.000	60.8	H	16.1	13.2	74.0

Frequency (MHz)	Average (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14392.000	48.6	H	17.0	5.4	54.0
14974.000	48.6	H	16.8	5.4	54.0
15764.000	49.3	H	16.4	4.7	54.0
16299.000	48.8	H	16.6	5.2	54.0
16821.000	49.0	H	16.6	5.0	54.0
17411.000	48.0	H	16.2	6.0	54.0

802.11b CH11 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
13908.000	59.4	V	16.3	14.6	74.0
14215.000	60.4	H	16.5	13.6	74.0
14818.000	59.9	H	16.6	14.1	74.0
15782.000	60.8	H	16.4	13.2	74.0
16076.000	60.3	H	16.6	13.7	74.0
16571.000	60.3	H	16.6	13.7	74.0

Frequency (MHz)	Average (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
9848.6250	48.2	H	17.9	5.8	54.0
14399.000	48.0	H	17.0	6.0	54.0
14973.000	47.7	H	16.8	6.3	54.0
15791.000	48.5	V	16.4	5.5	54.0
16299.000	47.9	H	16.6	6.1	54.0
16814.000	48.1	H	16.6	5.9	54.0

802.11g CH1 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
13946.000	60.5	H	16.1	13.5	74.0
14458.000	60.8	H	16.6	13.2	74.0
15067.000	60.7	H	16.1	13.3	74.0
15782.000	61.1	H	16.4	12.9	74.0
15849.000	61.6	H	16.6	12.4	74.0
16816.000	61.2	H	16.6	12.8	74.0

Frequency (MHz)	Average (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14405.000	48.5	H	17.0	5.5	54.0
14971.000	48.5	V	16.8	5.5	54.0
15787.000	49.4	H	16.4	4.6	54.0
16237.000	49.0	H	16.3	5.0	54.0
16791.000	49.1	H	16.5	4.9	54.0
17352.000	48.2	H	16.1	5.8	54.0

802.11g CH6 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14458.000	61.5	V	16.6	12.5	74.0
14962.000	60.6	H	16.8	13.4	74.0
15746.000	61.7	H	16.3	12.3	74.0
16227.000	61.7	H	16.2	12.3	74.0
16814.000	61.7	V	16.6	12.3	74.0
17276.000	60.9	H	16.1	13.1	74.0

Frequency (MHz)	Average (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14172.000	48.7	H	16.3	5.3	54.0
15153.000	48.6	H	15.8	5.4	54.0
15681.000	49.8	H	16.2	4.2	54.0
16220.000	49.8	H	16.2	4.2	54.0
16777.000	49.8	H	16.4	4.2	54.0
17291.000	49.0	H	16.1	5.0	54.0

802.11g CH11 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14385.000	61.1	V	17.0	12.9	74.0
15038.000	60.8	H	16.3	13.2	74.0
15660.000	61.9	H	16.1	12.1	74.0
16174.000	61.6	H	16.3	12.4	74.0
16827.000	61.6	H	16.7	12.4	74.0
17345.000	61.4	V	16.1	12.6	74.0

Frequency (MHz)	Average (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14183.000	48.6	H	16.4	5.4	54.0
14975.000	48.8	V	16.8	5.2	54.0
15703.000	49.7	H	16.2	4.3	54.0
16199.000	49.7	H	16.2	4.3	54.0
16834.000	49.7	H	16.7	4.3	54.0
17280.000	49.0	H	16.1	5.0	54.0

802.11n-20MHz CH1 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14547.000	61.0	H	16.1	13.0	74.0
14592.000	60.6	V	16.1	13.4	74.0
15622.000	61.7	H	16.1	12.3	74.0
16253.000	61.6	V	16.3	12.4	74.0
16708.000	62.3	H	16.1	11.7	74.0
17413.000	60.7	H	16.2	13.3	74.0

Frequency (MHz)	Average (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14016.000	48.7	H	16.0	5.3	54.0
14972.000	48.6	V	16.8	5.4	54.0
15674.000	49.8	H	16.2	4.2	54.0
16215.000	49.7	H	16.2	4.3	54.0
16769.000	49.8	H	16.4	4.2	54.0
17274.000	49.1	H	16.1	4.9	54.0

802.11n-20MHz CH6 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14272.000	60.9	H	16.8	13.1	74.0
15050.000	60.8	H	16.2	13.2	74.0
15812.000	62.4	V	16.5	11.6	74.0
15871.000	61.0	H	16.7	13.0	74.0
16717.000	61.0	H	16.2	13.0	74.0
17332.000	60.9	V	16.1	13.1	74.0

Frequency (MHz)	Average (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14193.000	48.5	H	16.4	5.5	54.0
14968.000	48.7	H	16.8	5.3	54.0
15756.000	49.5	H	16.3	4.5	54.0
16324.000	49.1	H	16.7	4.9	54.0
16829.000	49.1	V	16.7	4.9	54.0
17365.000	48.2	H	16.2	5.8	54.0

802.11n-20MHz CH11 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14273.000	60.7	V	16.8	13.3	74.0
15055.000	61.3	H	16.2	12.7	74.0
15796.000	61.5	V	16.4	12.5	74.0
16096.000	61.0	H	16.5	13.0	74.0
16865.000	61.1	H	16.9	12.9	74.0
17315.000	60.1	H	16.1	13.9	74.0

Frequency (MHz)	Average (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14390.000	48.4	V	17.0	5.6	54.0
14968.000	48.7	H	16.8	5.3	54.0
15781.000	49.2	V	16.4	4.8	54.0
16299.000	48.8	H	16.6	5.2	54.0
16826.000	49.1	V	16.7	4.9	54.0
17352.000	48.0	H	16.1	6.0	54.0

802.11n-40MHz CH3 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14450.000	61.1	V	16.7	12.9	74.0
15171.000	60.7	H	15.9	13.3	74.0
15767.000	61.9	V	16.4	12.1	74.0
16216.000	61.5	H	16.2	12.5	74.0
16719.000	62.2	V	16.2	11.8	74.0
17371.000	61.5	V	16.2	12.5	74.0

Frequency (MHz)	Average (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
13996.000	48.8	H	16.0	5.2	54.0
15051.000	48.7	V	16.2	5.3	54.0
15764.000	49.8	V	16.4	4.2	54.0
16218.000	49.7	H	16.2	4.3	54.0
16773.000	49.9	H	16.4	4.1	54.0
17286.000	49.0	H	16.1	5.0	54.0

802.11n-40MHz CH6 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
13847.000	61.2	H	16.6	12.8	74.0
14079.000	60.8	H	16.0	13.2	74.0
14814.000	61.6	V	16.6	12.4	74.0
15739.000	61.0	V	16.3	13.0	74.0
16388.000	61.3	H	16.9	12.7	74.0
16878.000	61.8	H	16.9	12.2	74.0

Frequency (MHz)	Average (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14451.000	48.6	H	16.7	5.4	54.0
14973.000	48.6	H	16.8	5.4	54.0
15771.000	49.5	H	16.4	4.5	54.0
16322.000	49.1	V	16.7	4.9	54.0
16829.000	49.4	V	16.7	4.6	54.0
17370.000	48.3	V	16.2	5.7	54.0

802.11n-40MHz CH9 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14452.000	61.1	H	16.6	12.9	74.0
14950.000	60.6	V	16.8	13.4	74.0
15754.000	61.6	H	16.3	12.4	74.0
16314.000	61.6	V	16.6	12.4	74.0
16754.000	61.0	H	16.3	13.0	74.0
17485.000	60.7	H	16.2	13.3	74.0

Frequency (MHz)	Average (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14401.000	48.5	H	17.0	5.5	54.0
15009.000	48.5	H	16.5	5.5	54.0
15786.000	49.4	H	16.4	4.6	54.0
16312.000	49.0	V	16.6	5.0	54.0
16821.000	49.1	H	16.6	4.9	54.0
17375.000	48.0	H	16.2	6.0	54.0

See ANNEX C for test graphs.

Conclusion: PASS

Note:

A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

P_{Mea} is the field strength recorded from the instrument.

The measurement results are obtained as described below:

Result= $P_{Mea}+A_{Rpl}= P_{Mea}+Cable\ Loss+Antenna\ Factor$

B.6 AC Powerline Conducted Emission

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	Fig.66 to 56	Fig.199	Fig.200	P
0.5 to 5	56			
5 to 30	60			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

WLAN (Average Limit)

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.199	Fig.200	P
0.5 to 5	46			
5 to 30	50			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

See ANNEX C for test graphs.

Conclusion: PASS

ANNEX C: TEST LAYOUTS

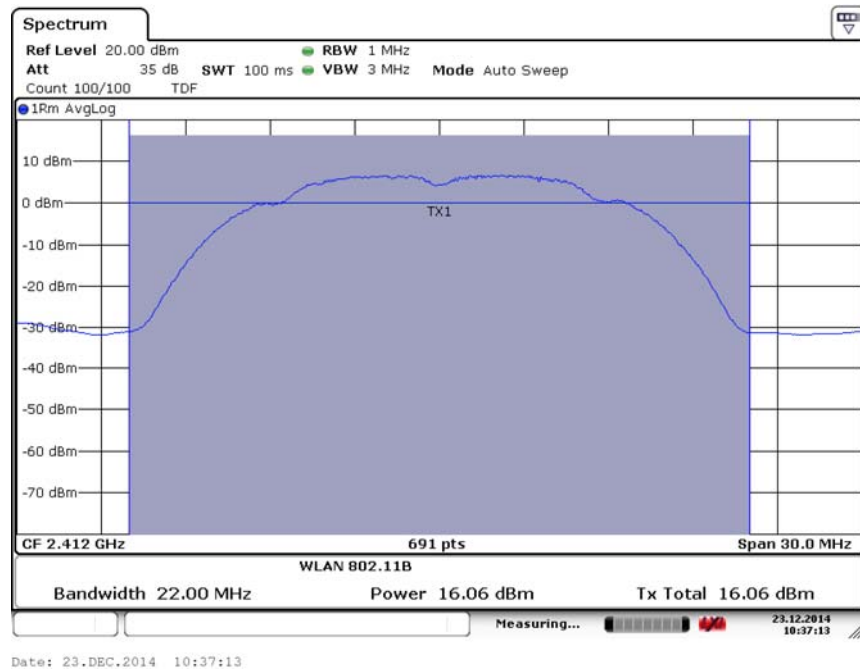


Fig.1 Maximum Average Output Power (802.11b, Ch 1,1Mbps)

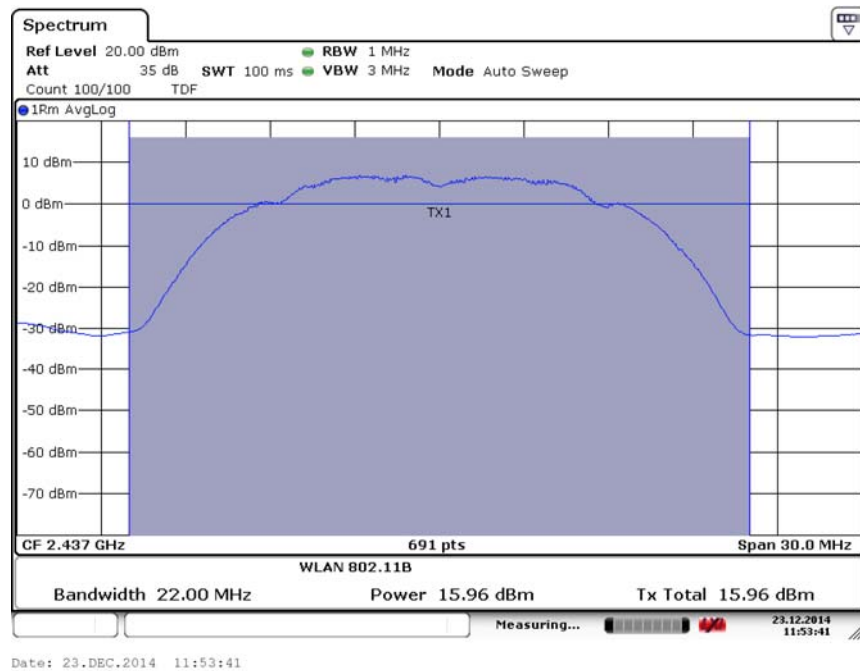


Fig.2 Maximum Average Output Power (802.11b, Ch 6,1Mbps)

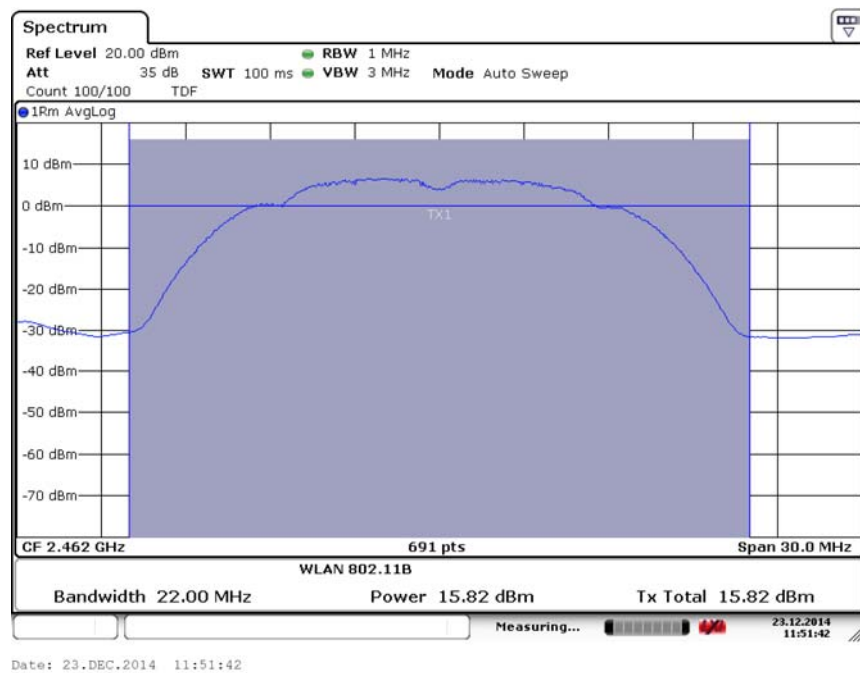


Fig.3 Maximum Average Output Power (802.11b, Ch 11,1Mbps)

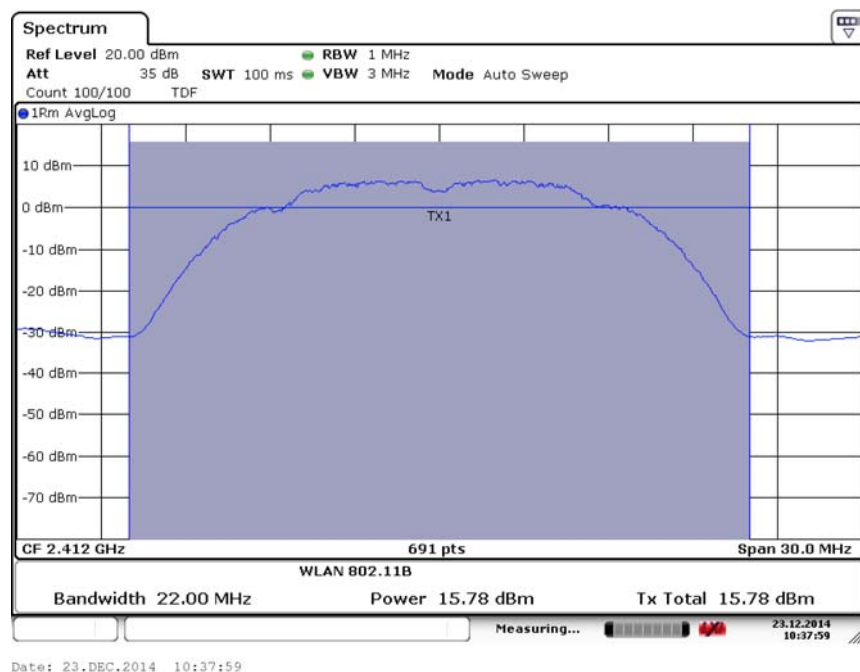


Fig.4 Maximum Average Output Power (802.11b, Ch 1,2Mbps)

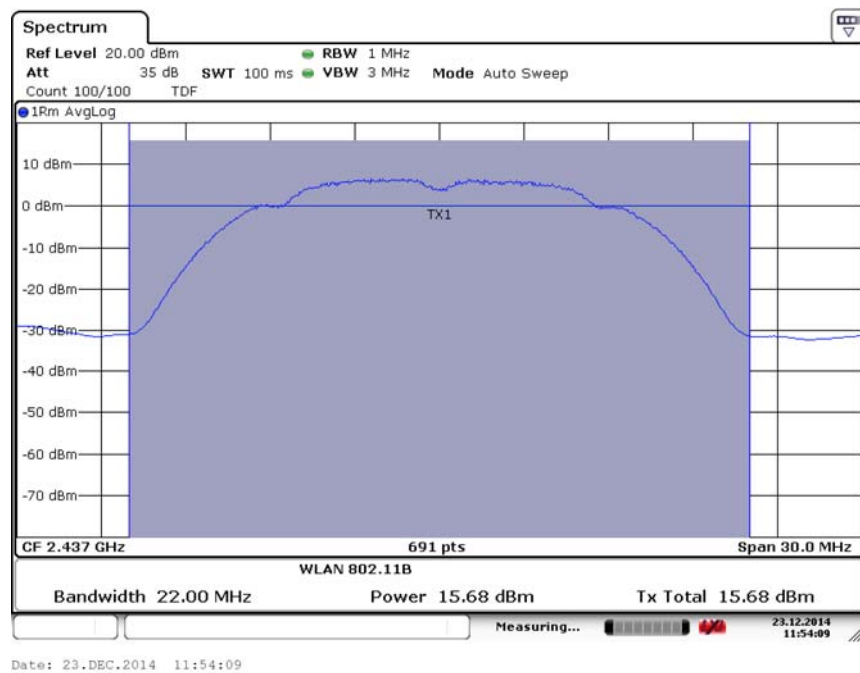


Fig.5 Maximum Average Output Power (802.11b, Ch 6,2Mbps)

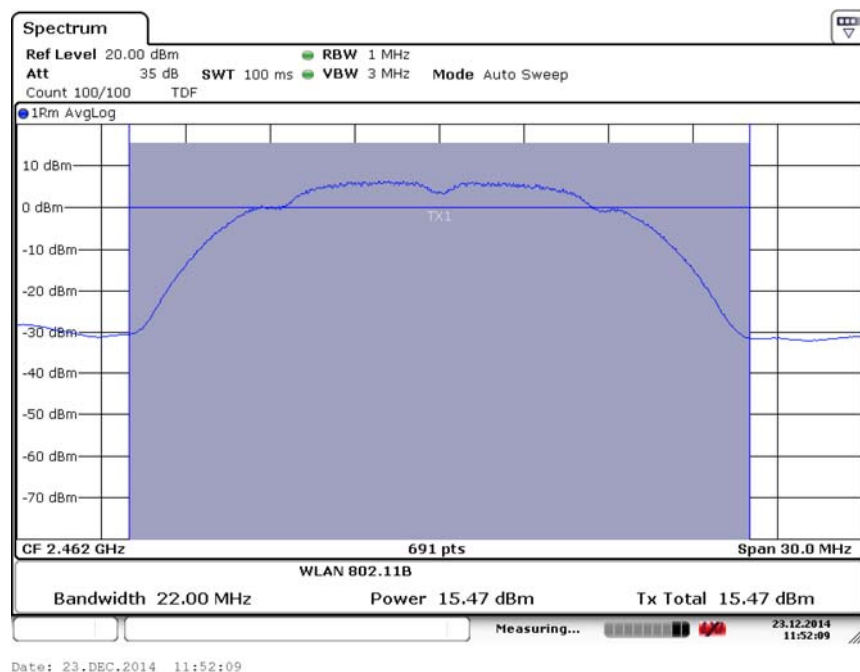


Fig.6 Maximum Average Output Power (802.11b, Ch 11,2Mbps)

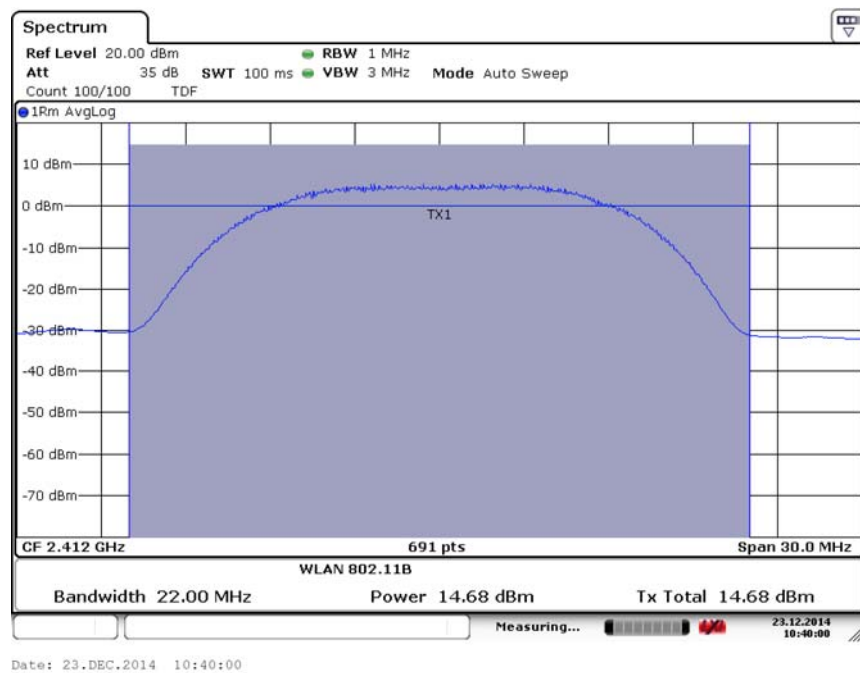


Fig.7 Maximum Average Output Power (802.11b, Ch 1,5.5Mbps)

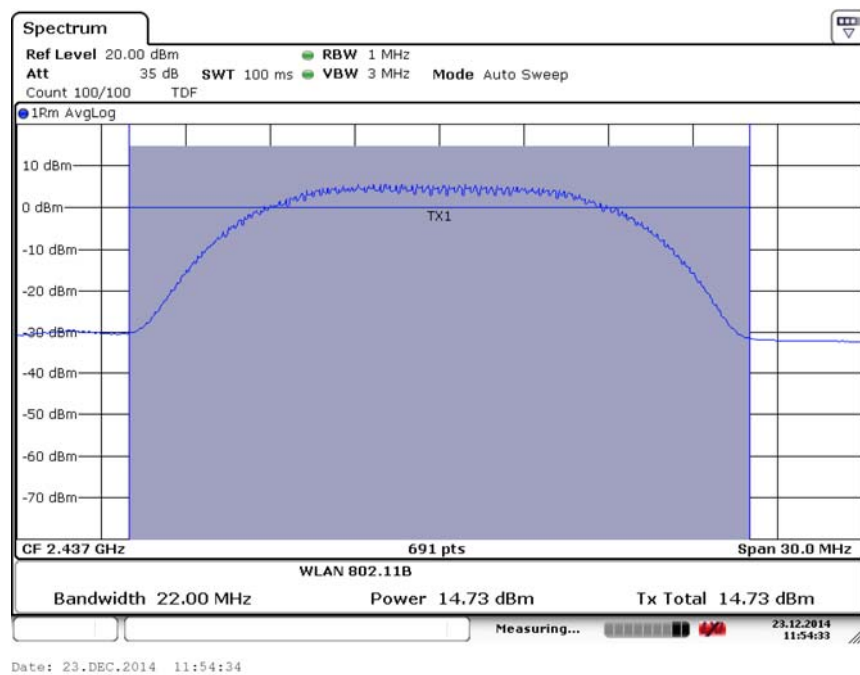


Fig.8 Maximum Average Output Power (802.11b, Ch 6,5.5Mbps)

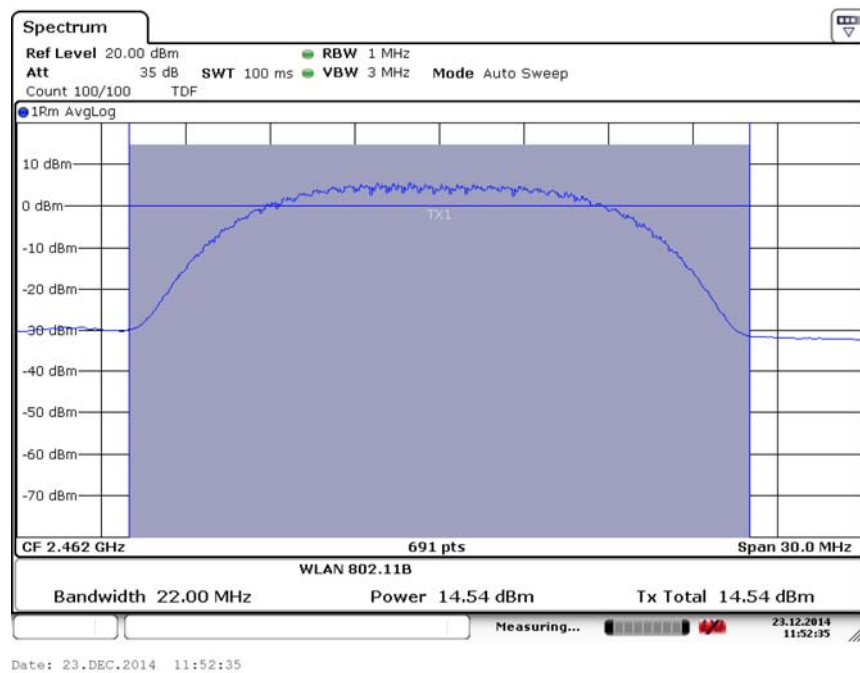


Fig.9 Maximum Average Output Power (802.11b, Ch 11,5.5Mbps)

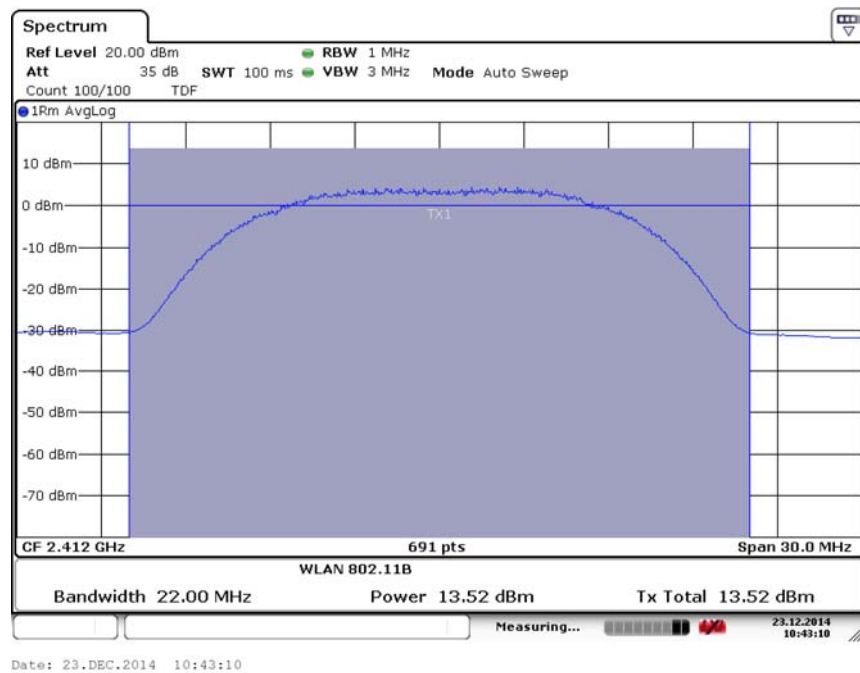


Fig.10 Maximum Average Output Power (802.11b, Ch 1,11Mbps)

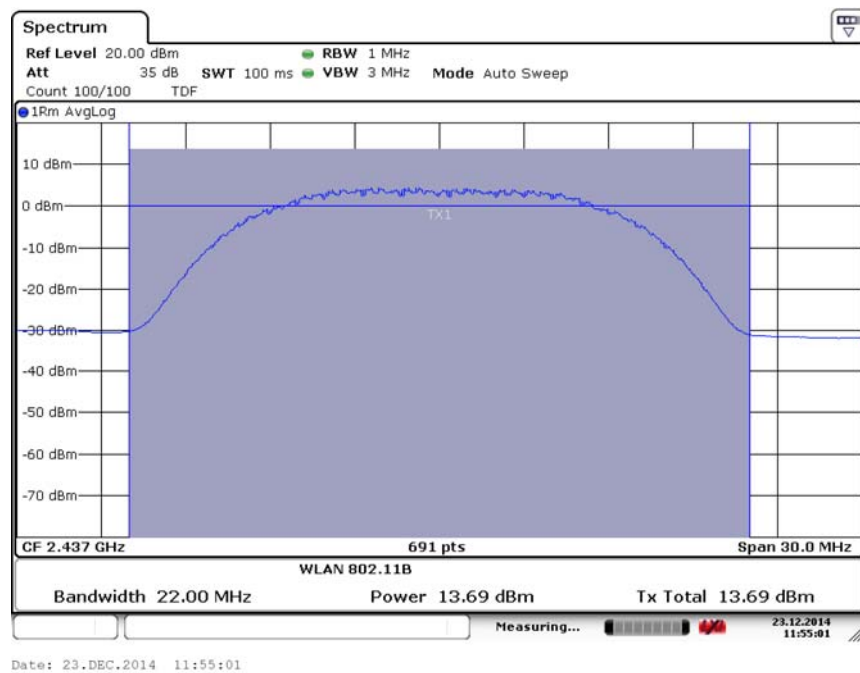


Fig.11 Maximum Average Output Power (802.11b, Ch 6,11Mbps)

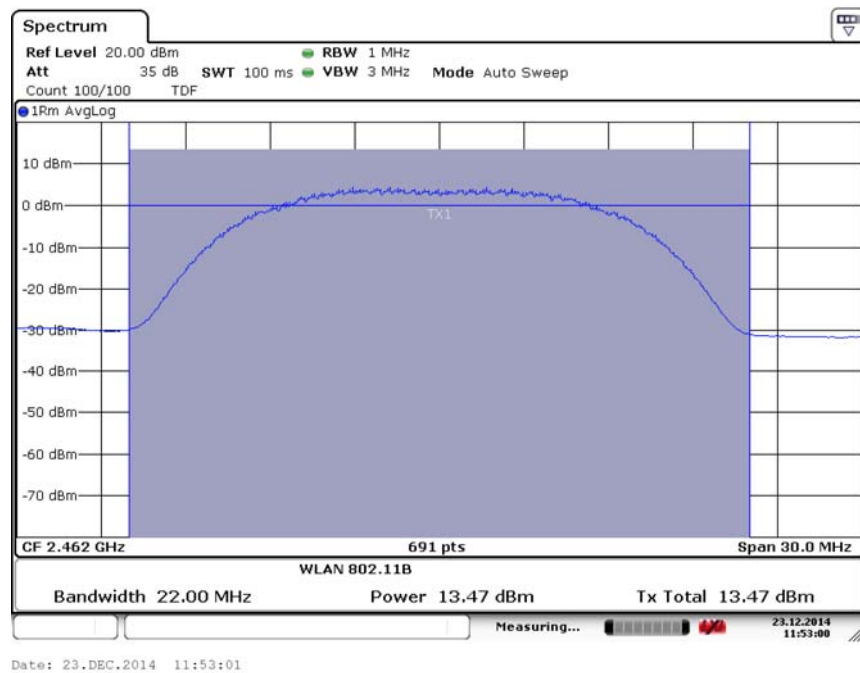


Fig.12 Maximum Average Output Power (802.11b, Ch 11,11Mbps)

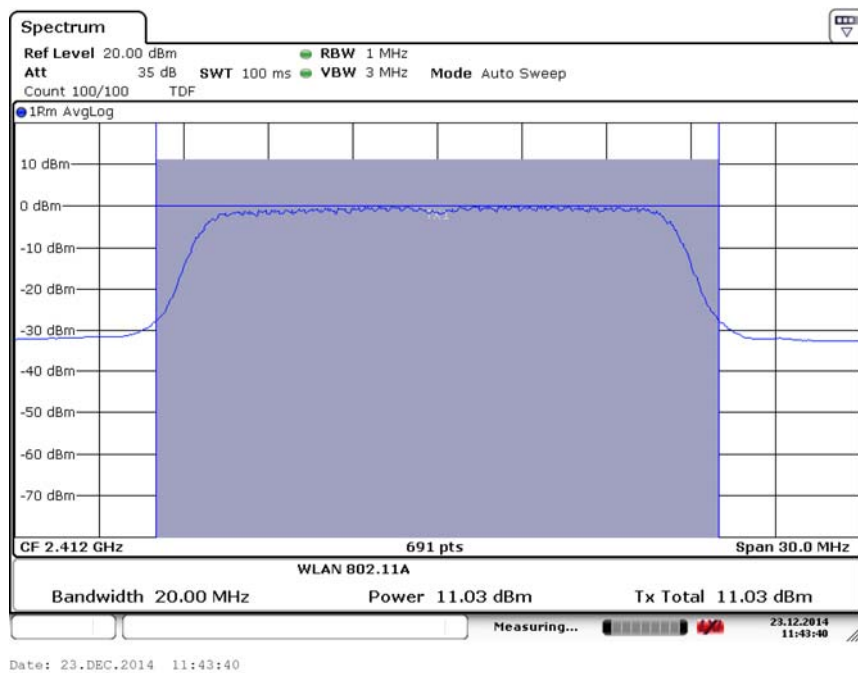


Fig.13 Maximum Average Output Power (802.11g, Ch 1,6Mbps)

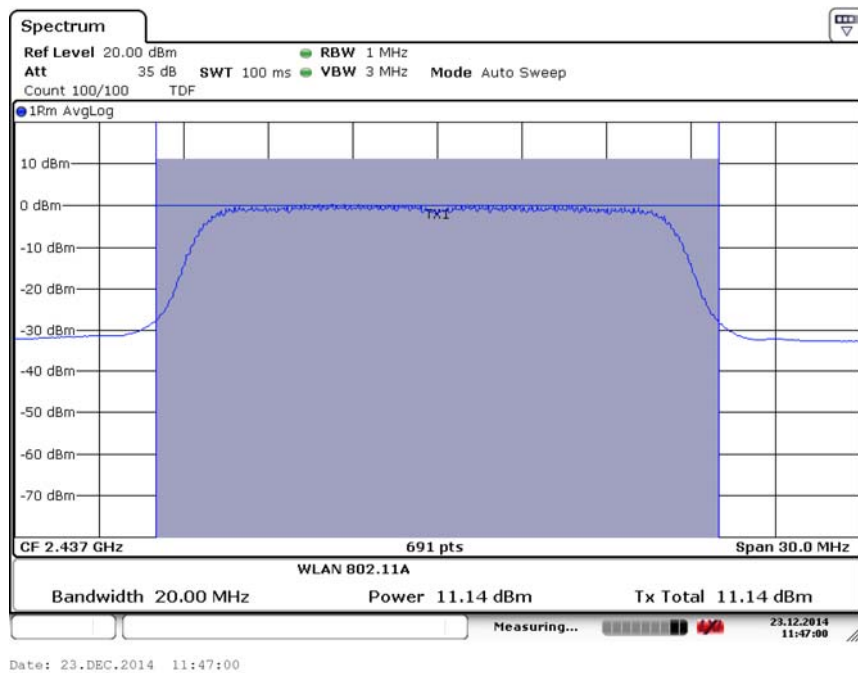


Fig.14 Maximum Average Output Power (802.11g, Ch 6,6Mbps)

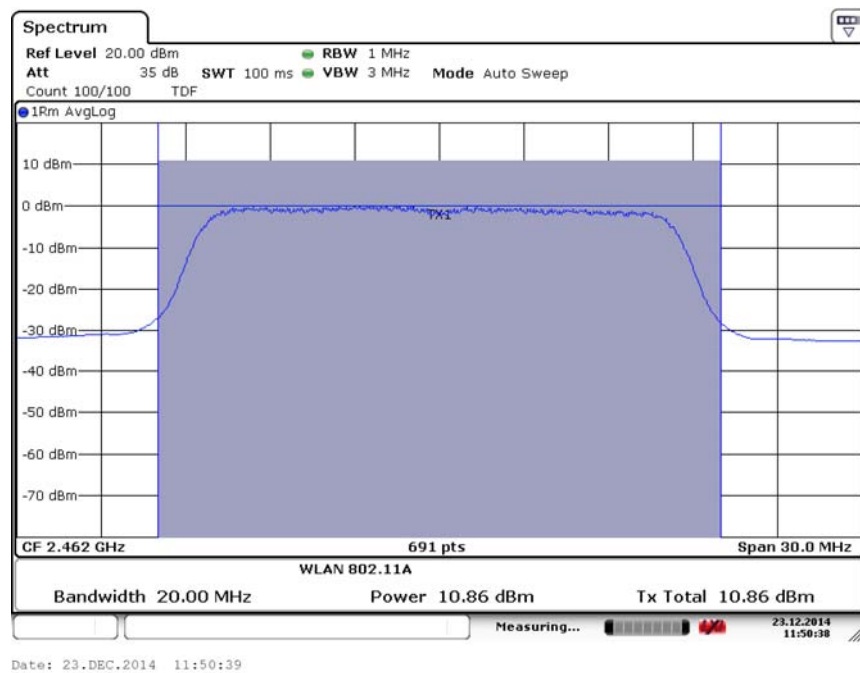


Fig.15 Maximum Average Output Power (802.11g, Ch 11,6Mbps)

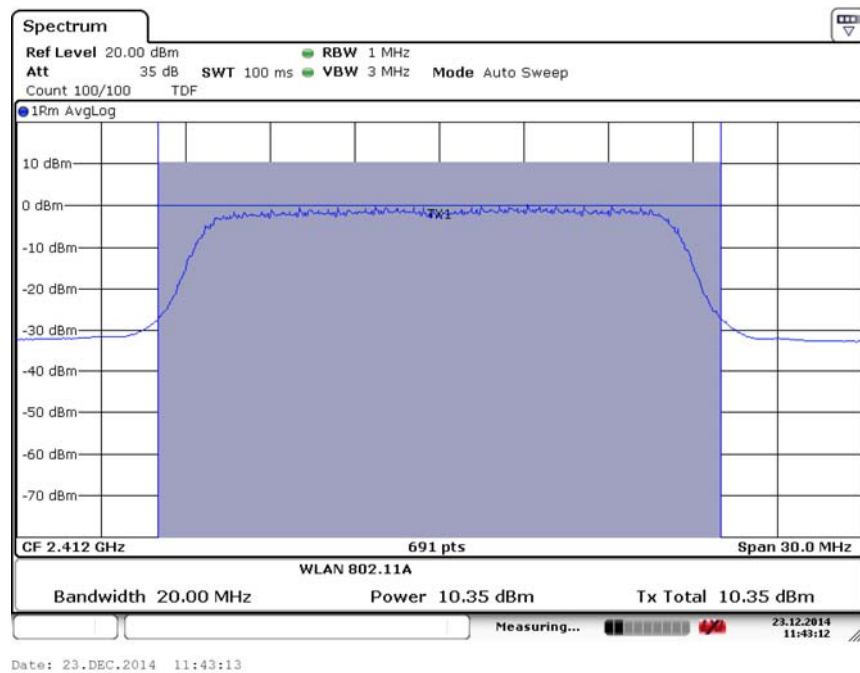


Fig.16 Maximum Average Output Power (802.11g, Ch 1,9Mbps)

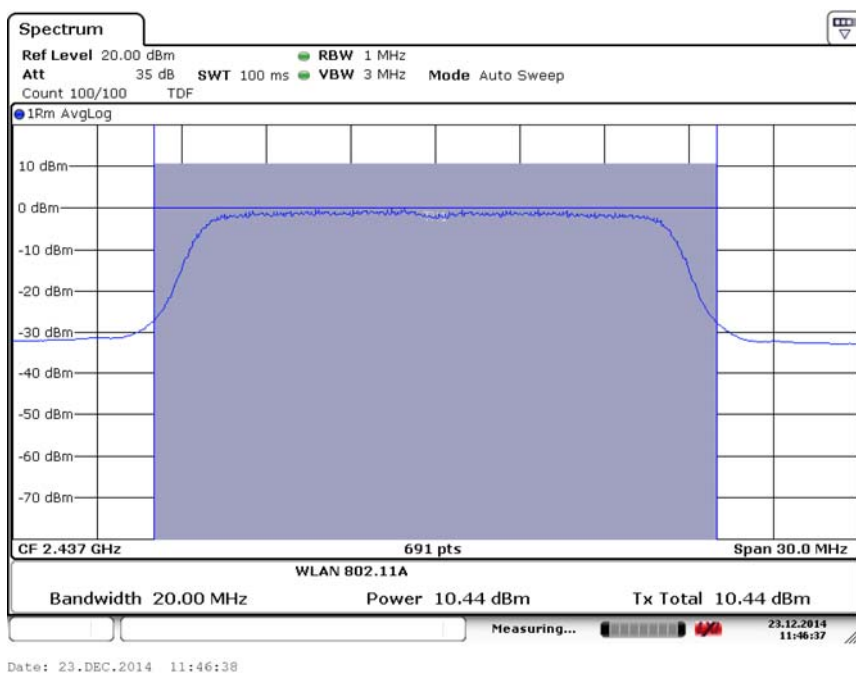


Fig.17 Maximum Average Output Power (802.11g, Ch 6,9Mbps)

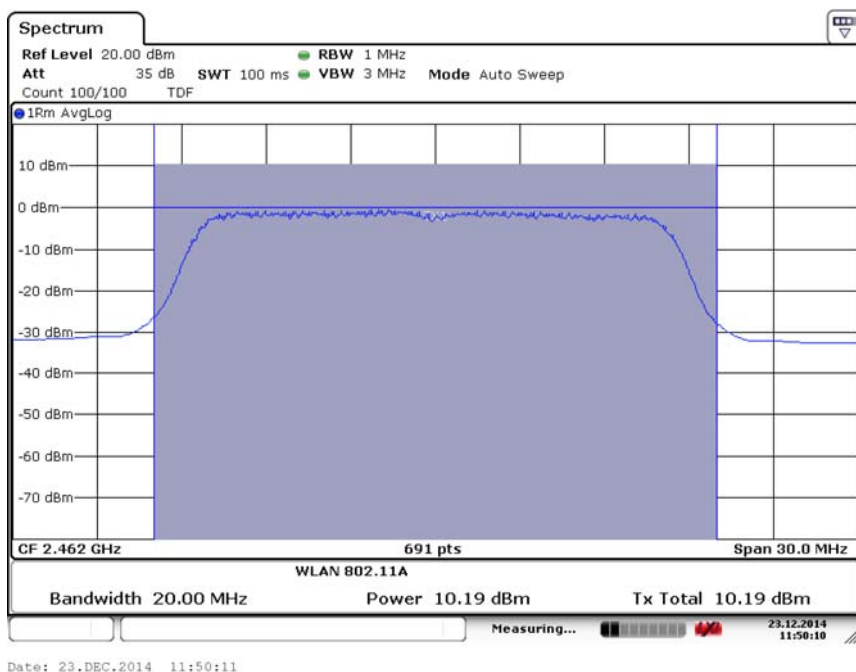


Fig.18 Maximum Average Output Power (802.11g, Ch 11,9Mbps)

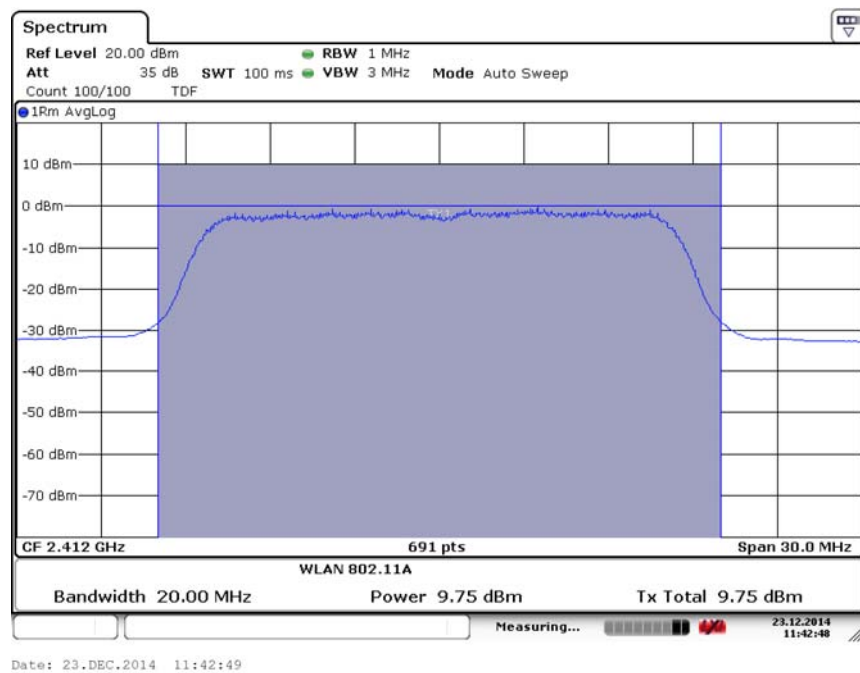


Fig.19 Maximum Average Output Power (802.11g, Ch 1,12Mbps)

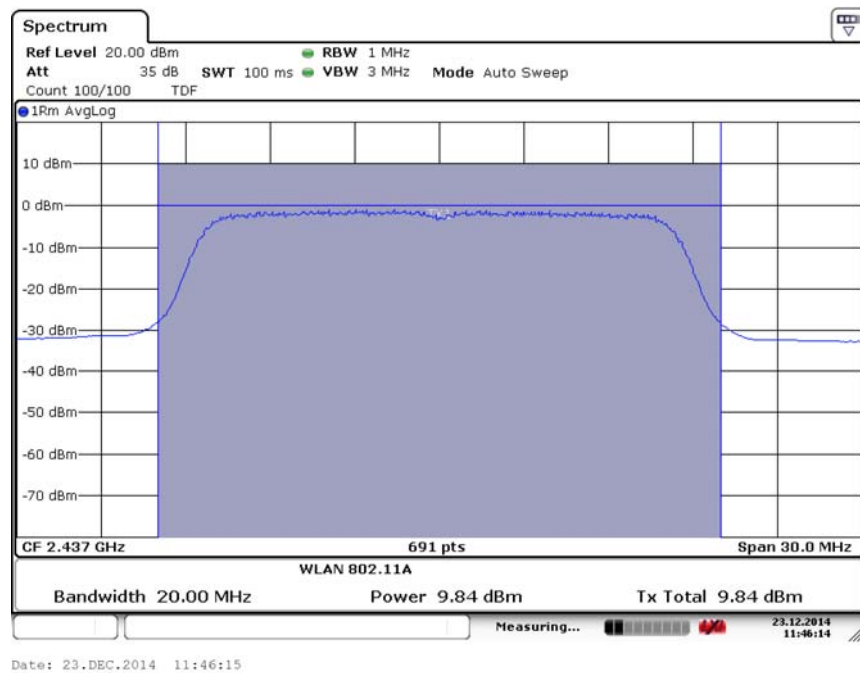


Fig.20 Maximum Average Output Power (802.11g, Ch 6,12Mbps)

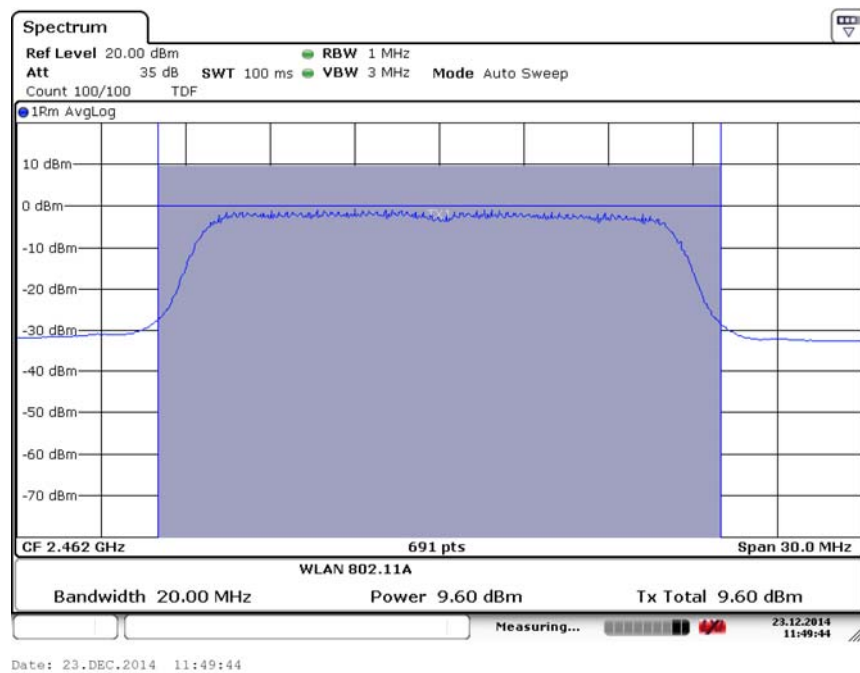


Fig.21 Maximum Average Output Power (802.11g, Ch 11,12Mbps)

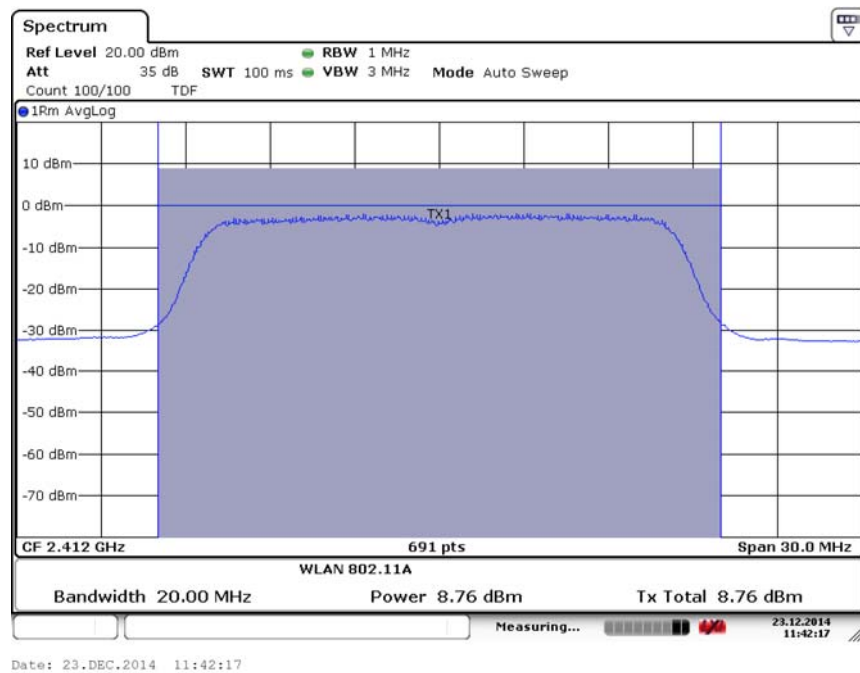


Fig.22 Maximum Average Output Power (802.11g, Ch 1,18Mbps)

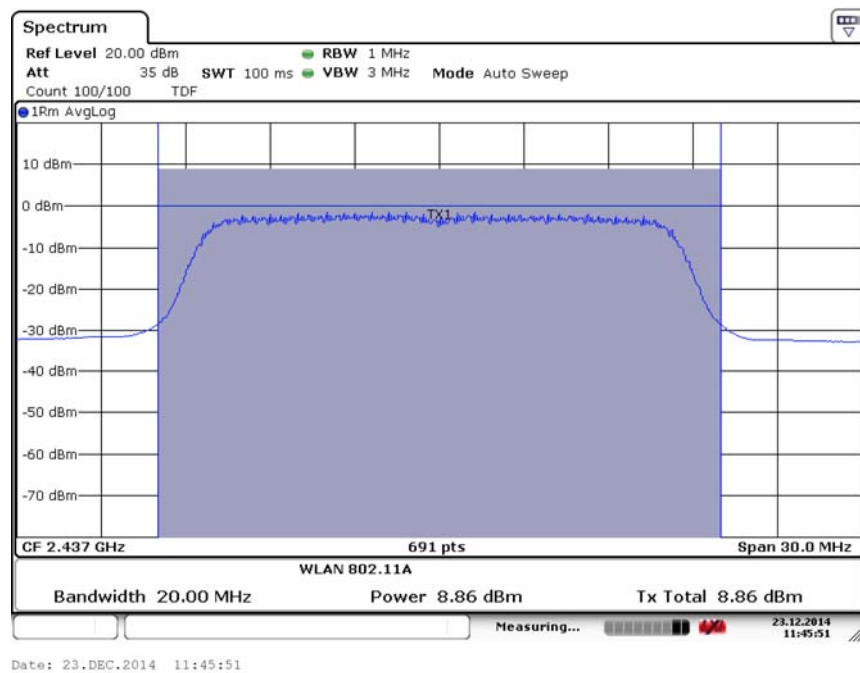


Fig.23 Maximum Average Output Power (802.11g, Ch 6,18Mbps)

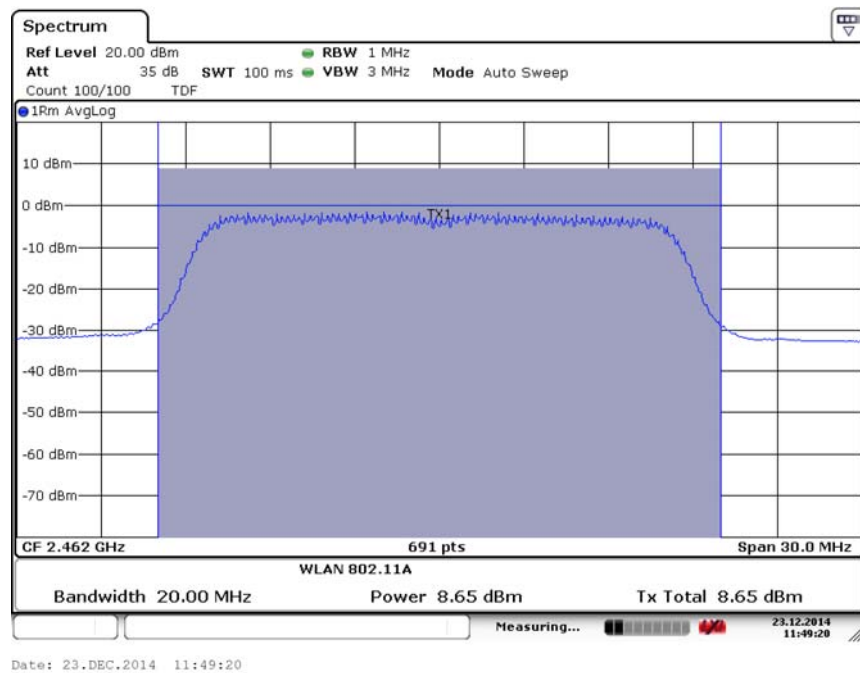


Fig.24 Maximum Average Output Power (802.11g, Ch 11,18Mbps)

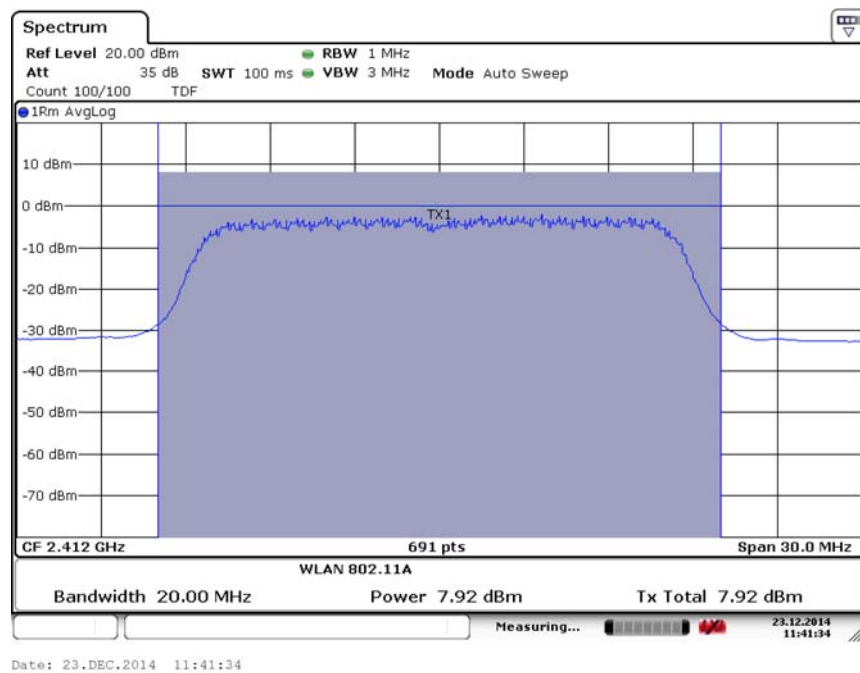


Fig.25 Maximum Average Output Power (802.11g, Ch 1,24Mbps)

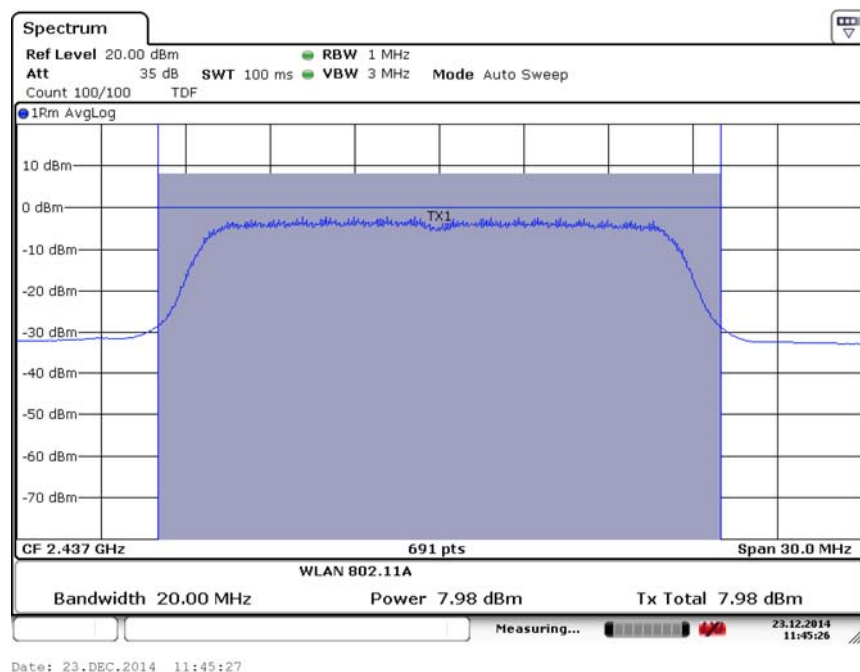


Fig.26 Maximum Average Output Power (802.11g, Ch 6,24Mbps)

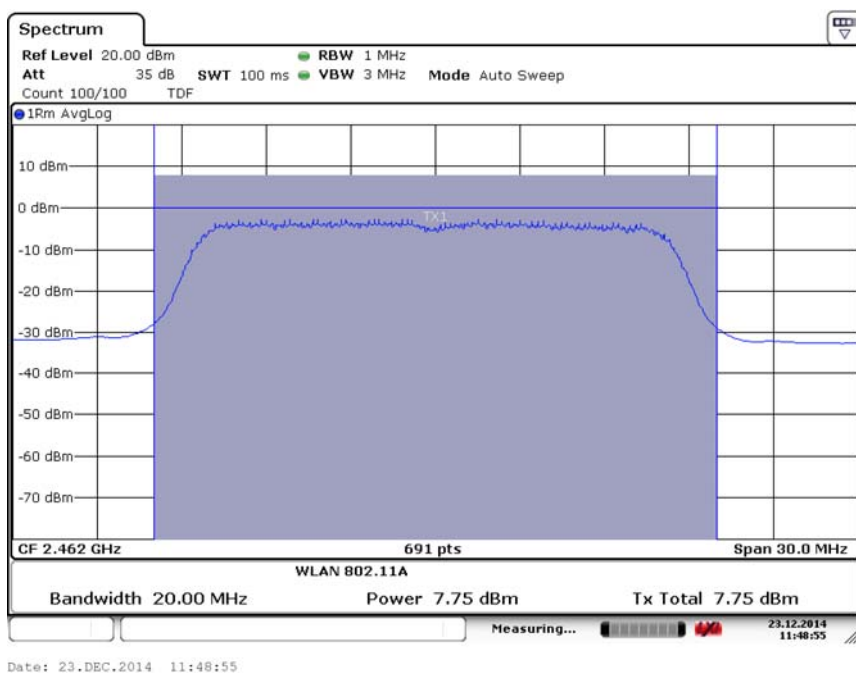


Fig.27 Maximum Average Output Power (802.11g, Ch 11,24Mbps)

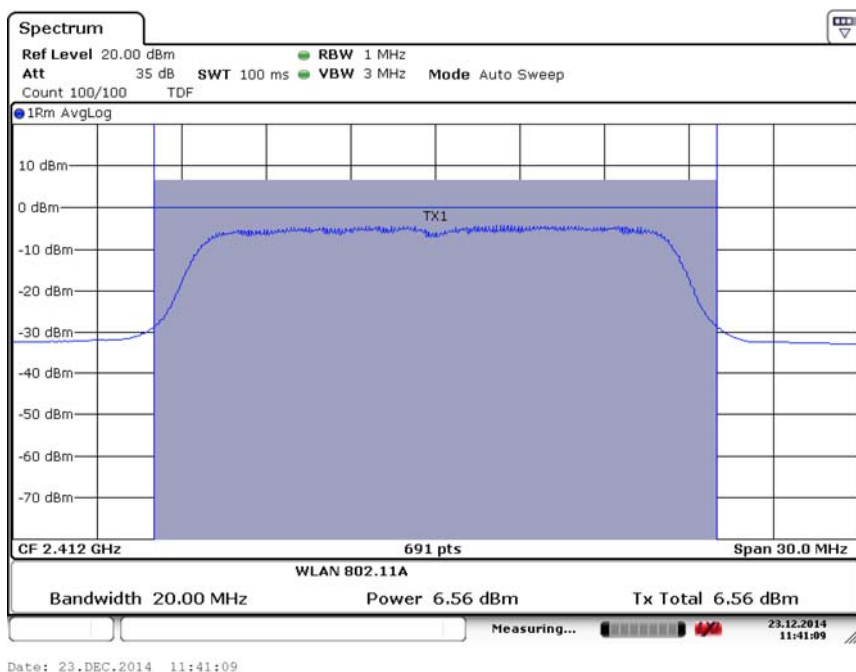


Fig.28 Maximum Average Output Power (802.11g, Ch 1,36Mbps)

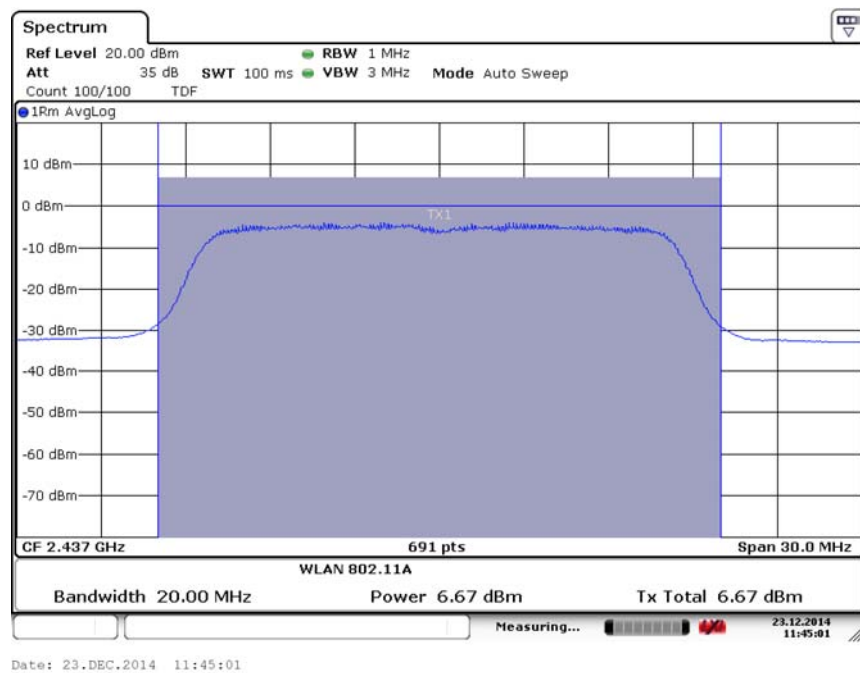


Fig.29 Maximum Average Output Power (802.11g, Ch 6,36Mbps)

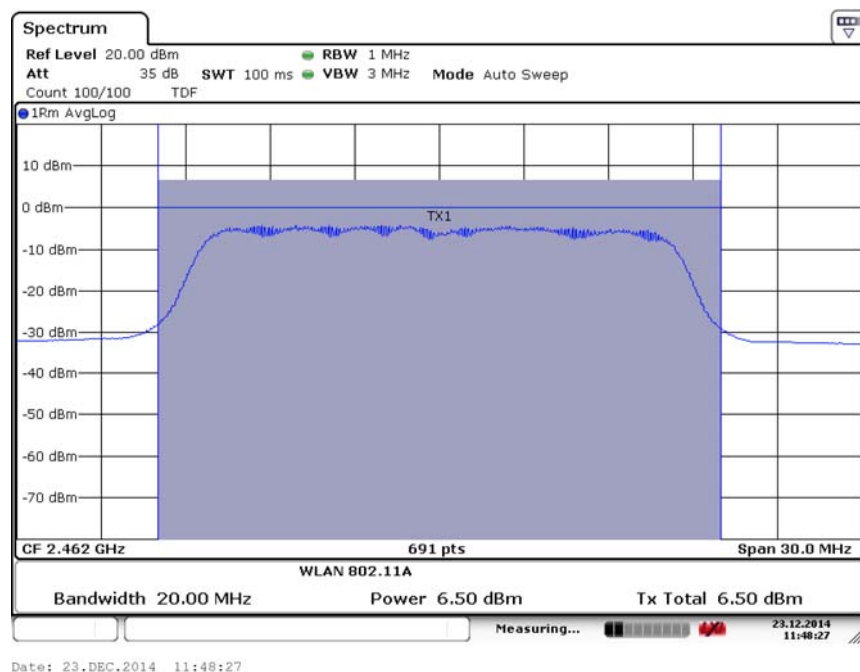


Fig.30 Maximum Average Output Power (802.11g, Ch 11,36Mbps)

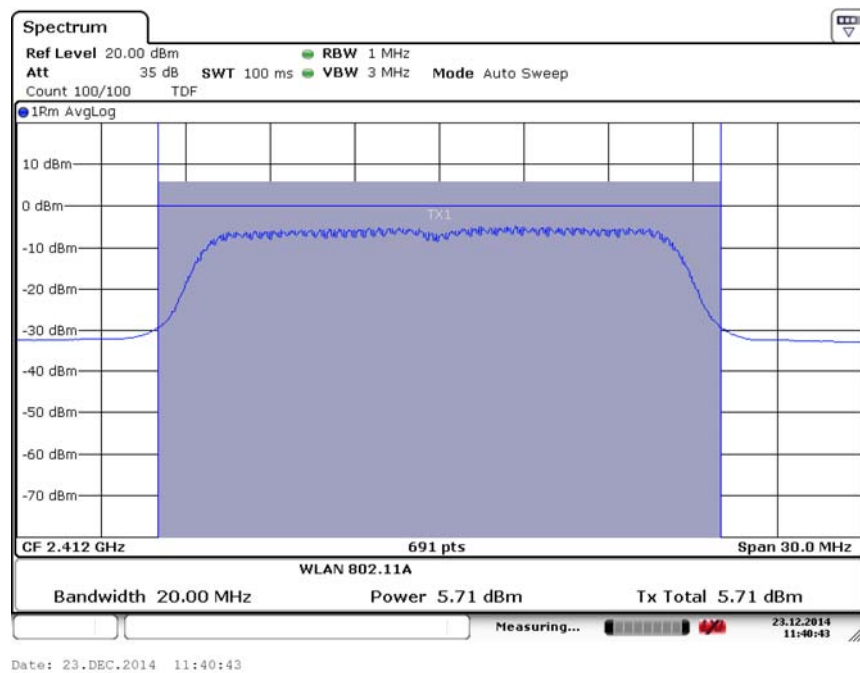


Fig.31 Maximum Average Output Power (802.11g, Ch 1,48Mbps)

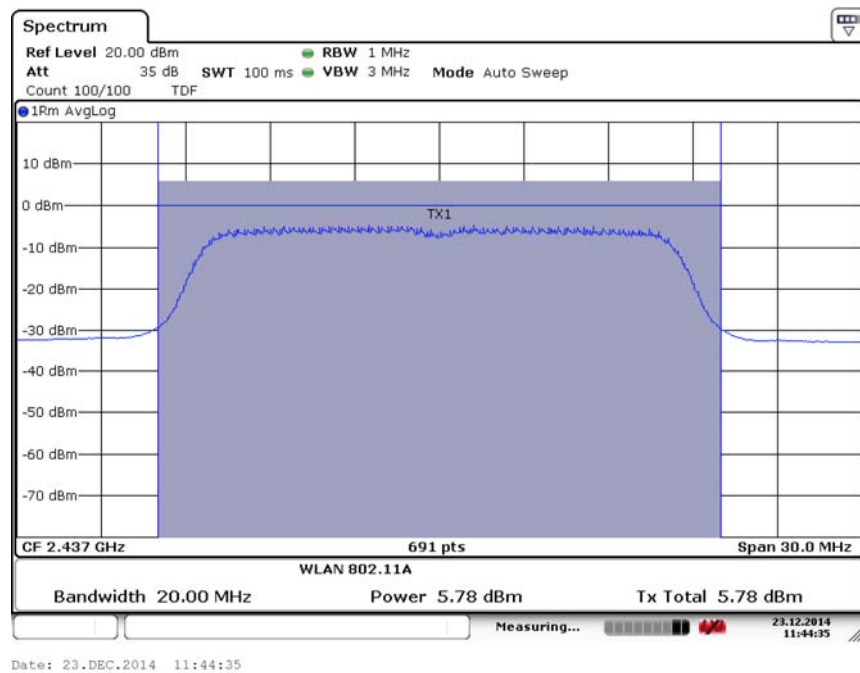


Fig.32 Maximum Average Output Power (802.11g, Ch 6,48Mbps)

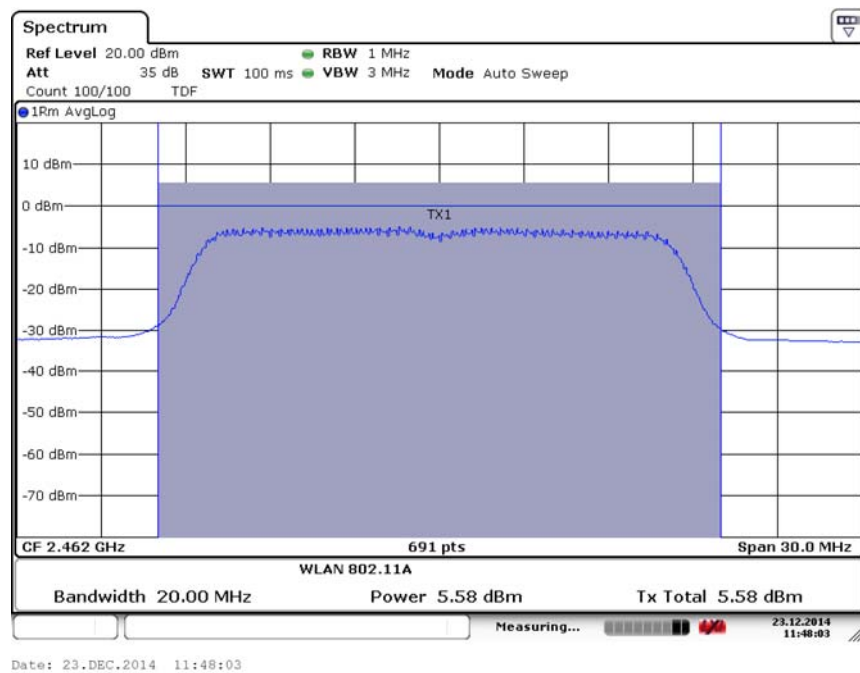


Fig.33 Maximum Average Output Power (802.11g, Ch 11,48Mbps)

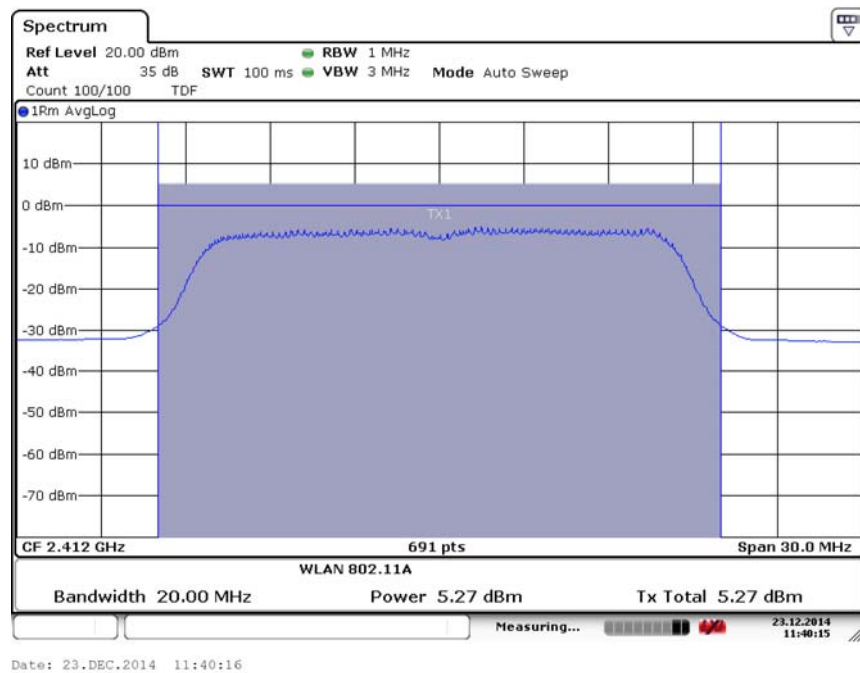


Fig.34 Maximum Average Output Power (802.11g, Ch 1,54Mbps)

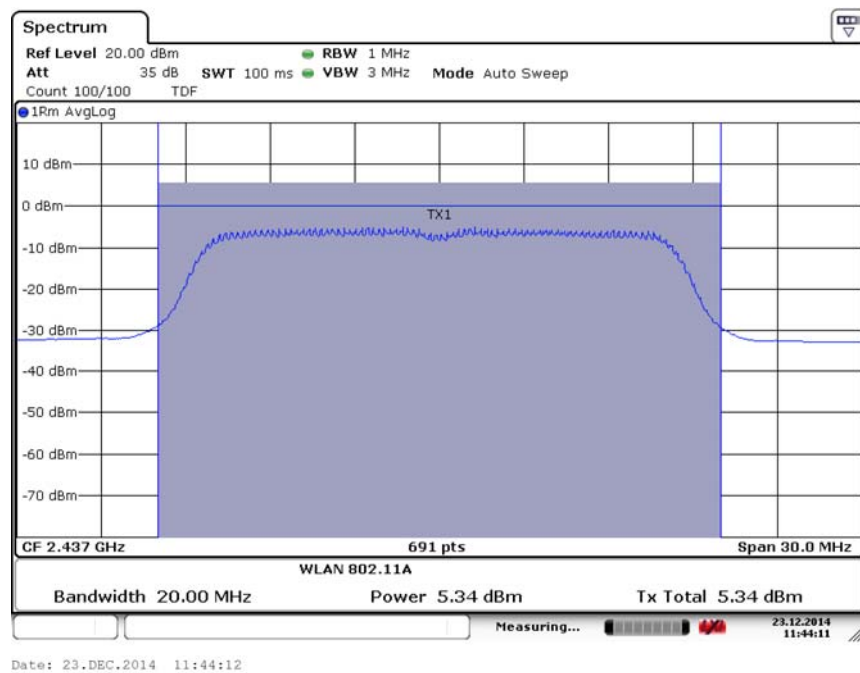


Fig.35 Maximum Average Output Power (802.11g, Ch 6,54Mbps)

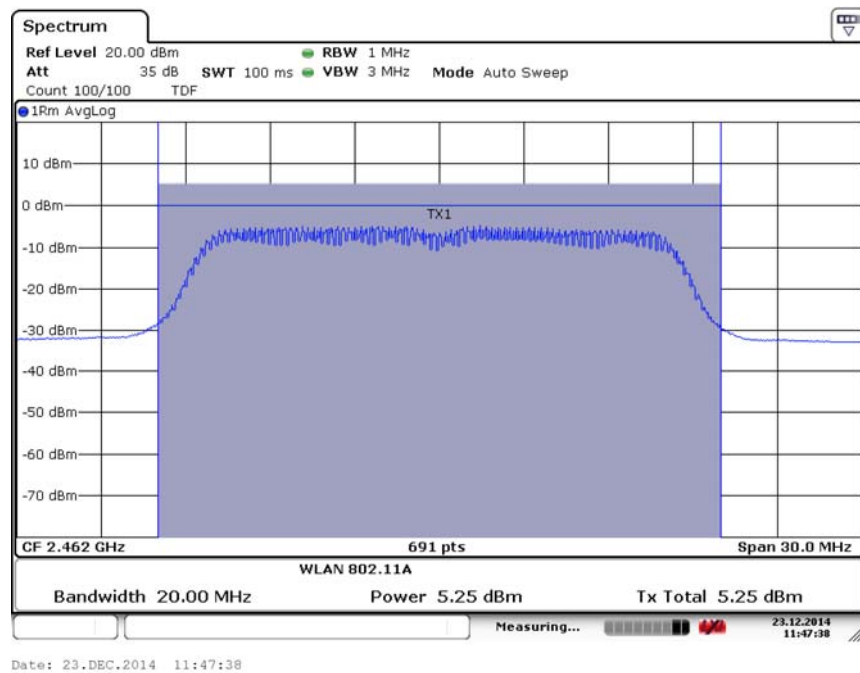


Fig.36 Maximum Average Output Power (802.11g, Ch 11,54Mbps)

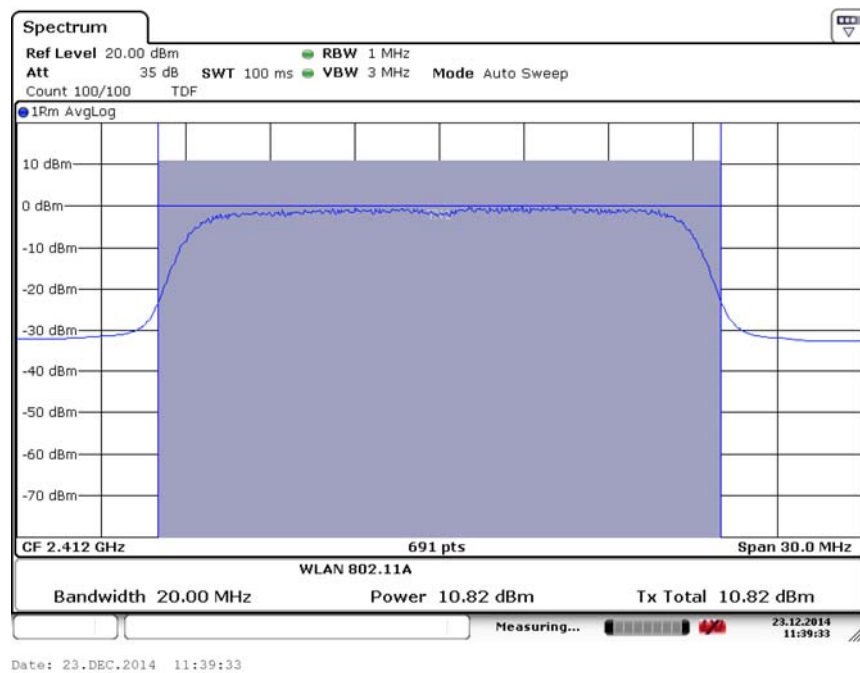


Fig.37 Maximum Average Output Power (802.11n-20MHz, Ch 1,MCS0)

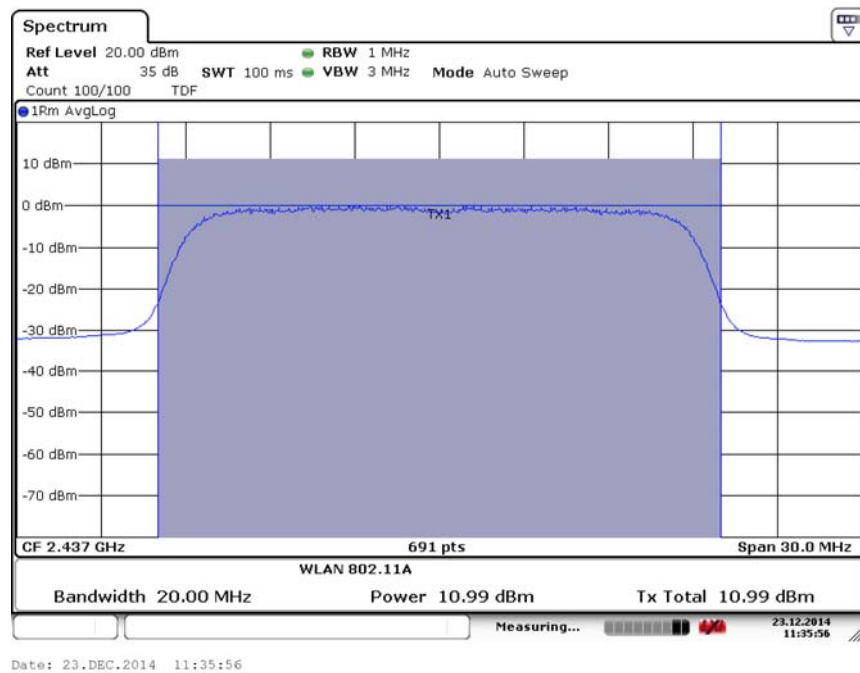


Fig.38 Maximum Average Output Power (802.11n-20MHz, Ch 6,MCS0)

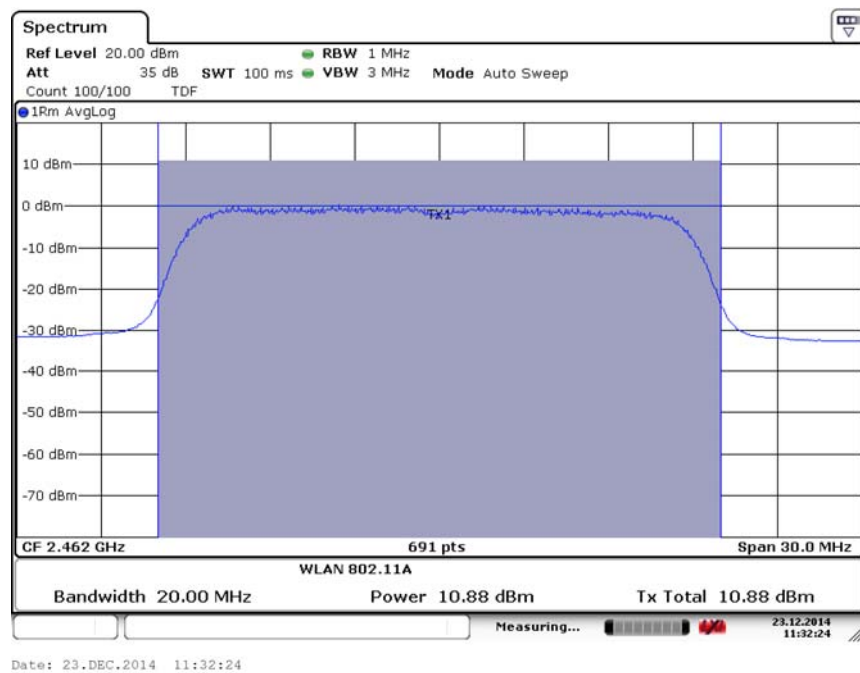


Fig.39 Maximum Average Output Power (802.11n-20MHz, Ch 11,MCS0)

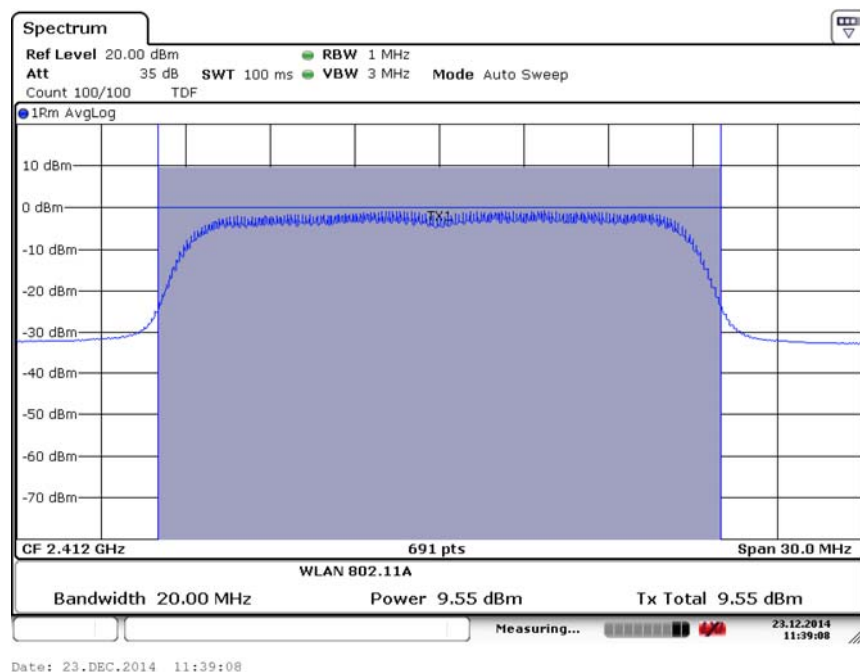


Fig.40 Maximum Average Output Power (802.11n-20MHz, Ch 1,MCS1)

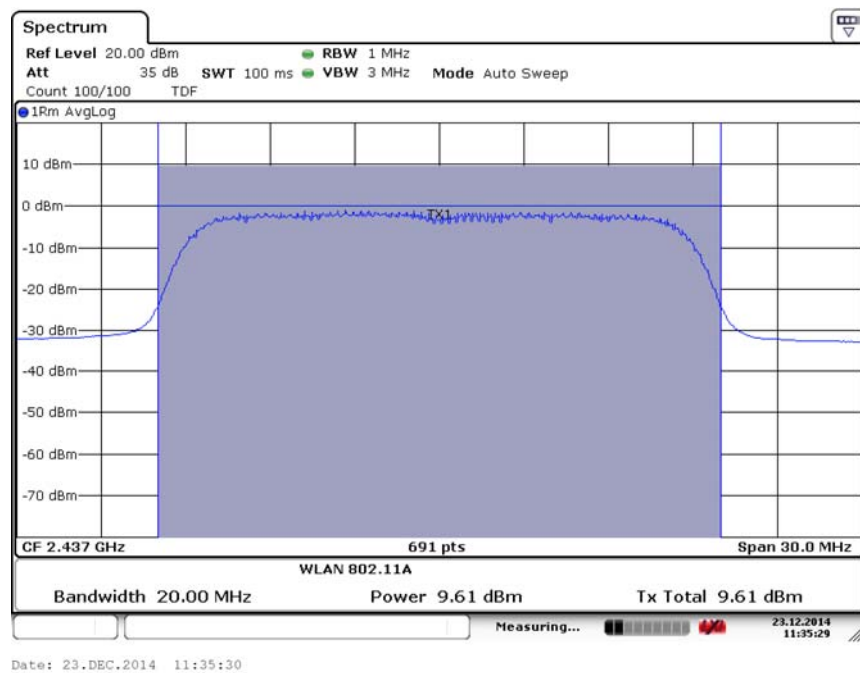


Fig.41 Maximum Average Output Power (802.11n-20MHz, Ch 6,MCS1)

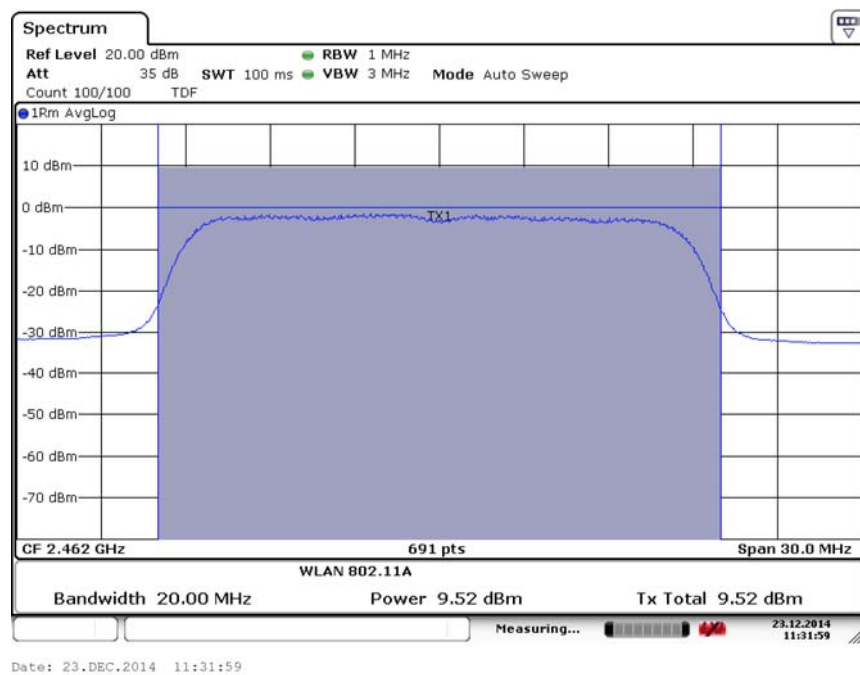


Fig.42 Maximum Average Output Power (802.11n-20MHz, Ch 11,MCS1)

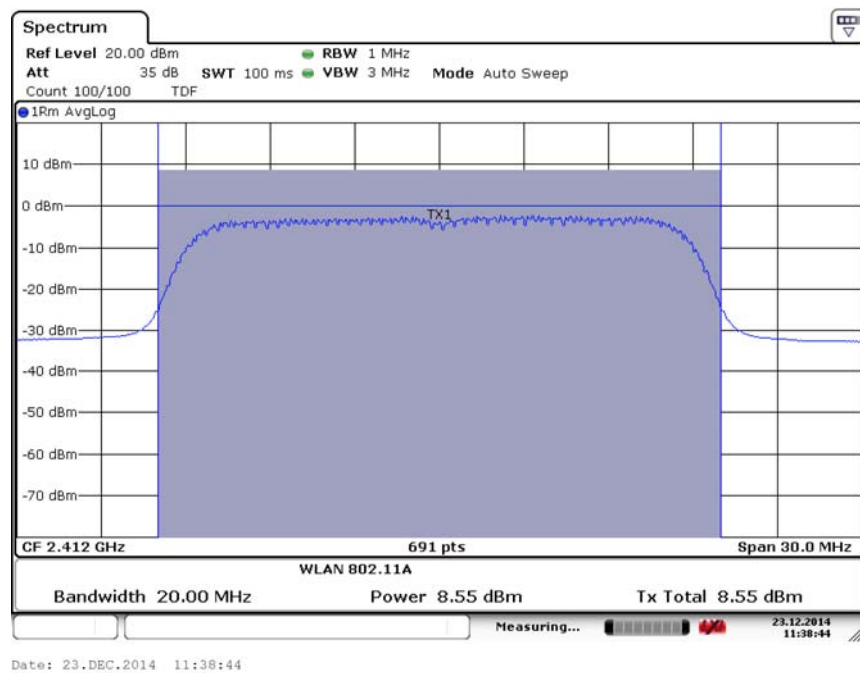


Fig.43 Maximum Average Output Power (802.11n-20MHz, Ch 1,MCS2)

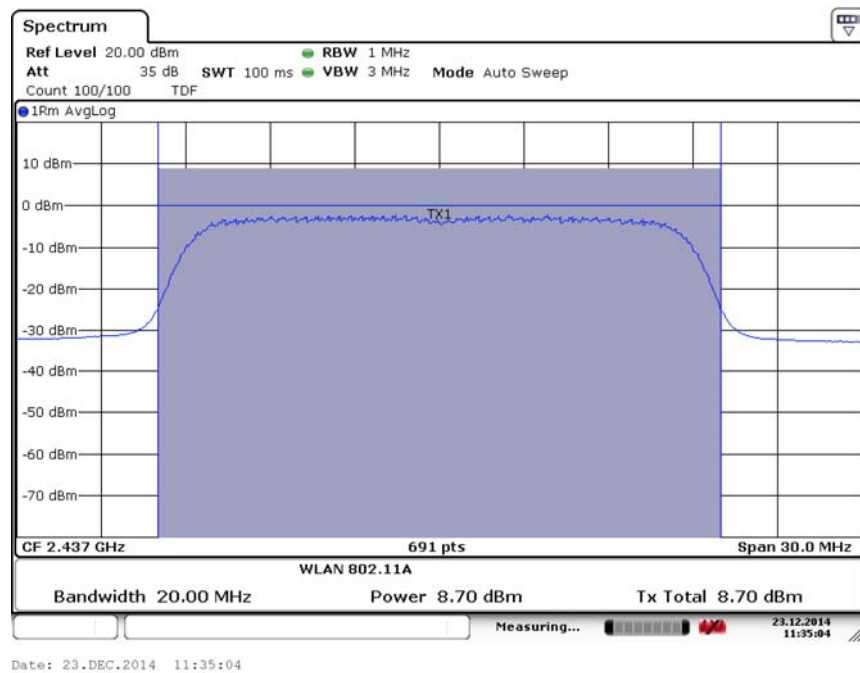


Fig.44 Maximum Average Output Power (802.11n-20MHz, Ch 6,MCS2))

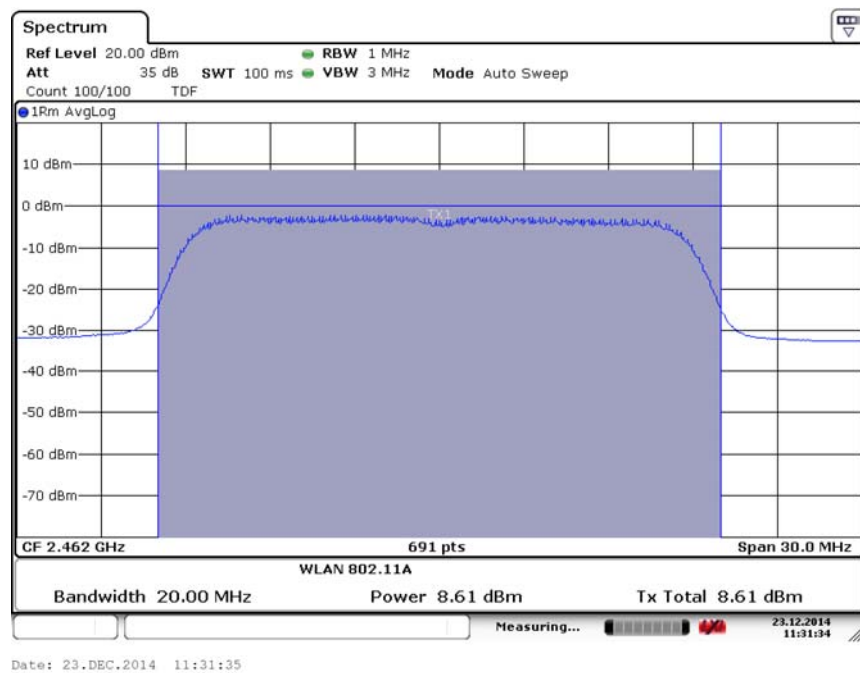


Fig.45 Maximum Average Output Power (802.11n-20MHz, Ch 11,MCS2)

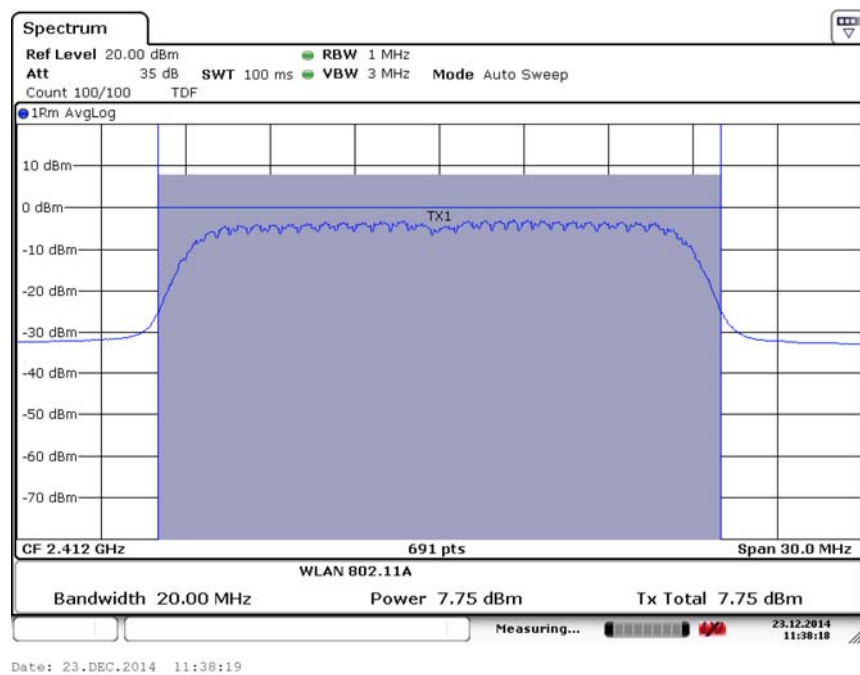


Fig.46 Maximum Average Output Power (802.11n-20MHz, Ch 1,MCS3)

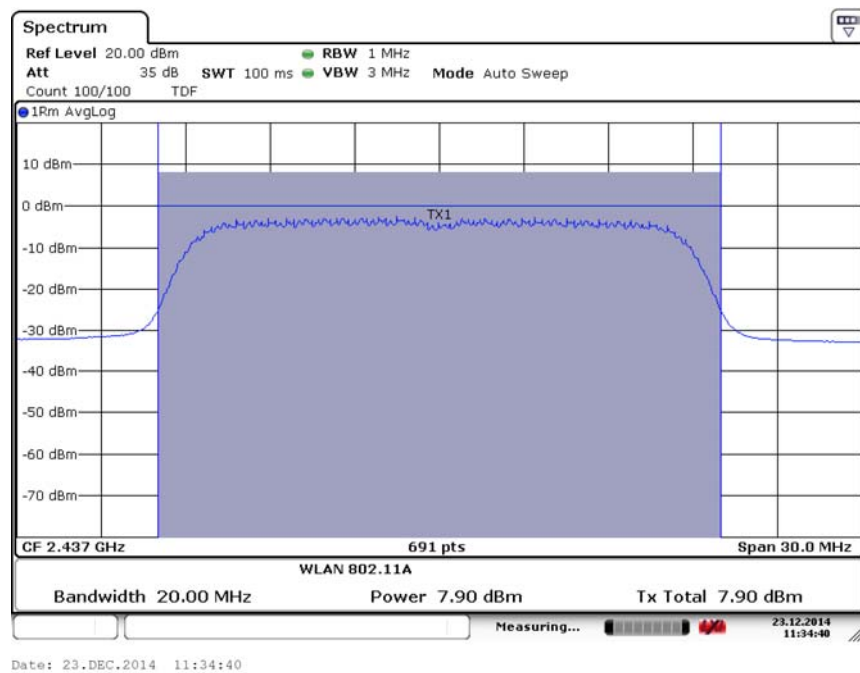


Fig.47 Maximum Average Output Power (802.11n-20MHz, Ch 6,MCS3)

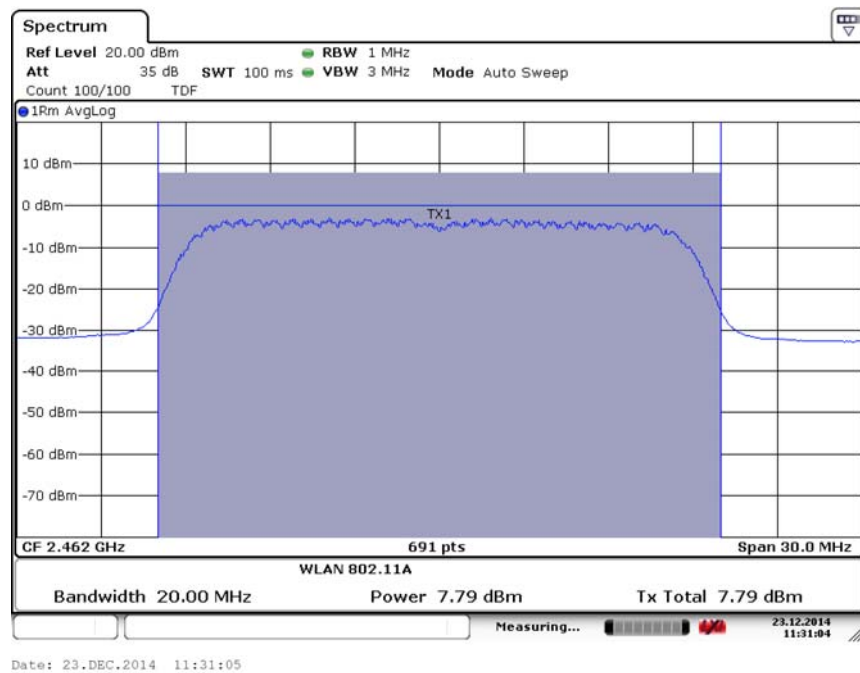


Fig.48 Maximum Average Output Power (802.11n-20MHz, Ch 11,MCS3)

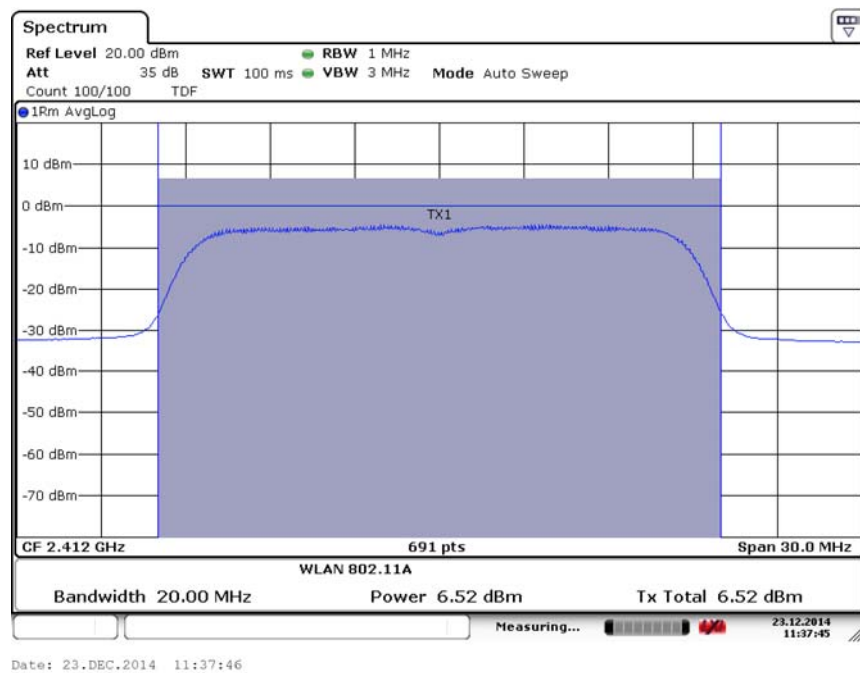


Fig.49 Maximum Average Output Power (802.11n-20MHz, Ch 1,MCS4)

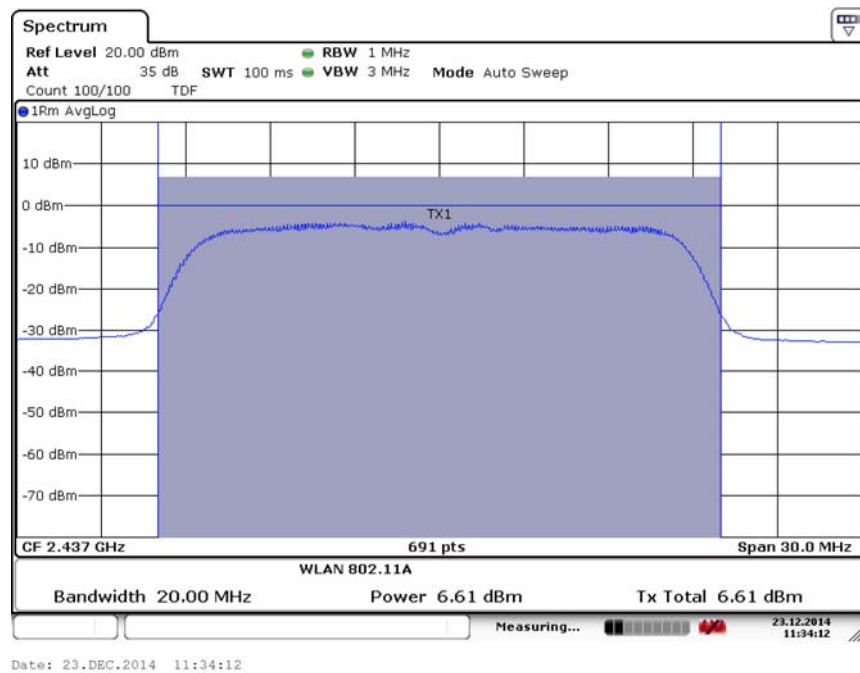


Fig.50 Maximum Average Output Power (802.11n-20MHz, Ch 6,MCS4)

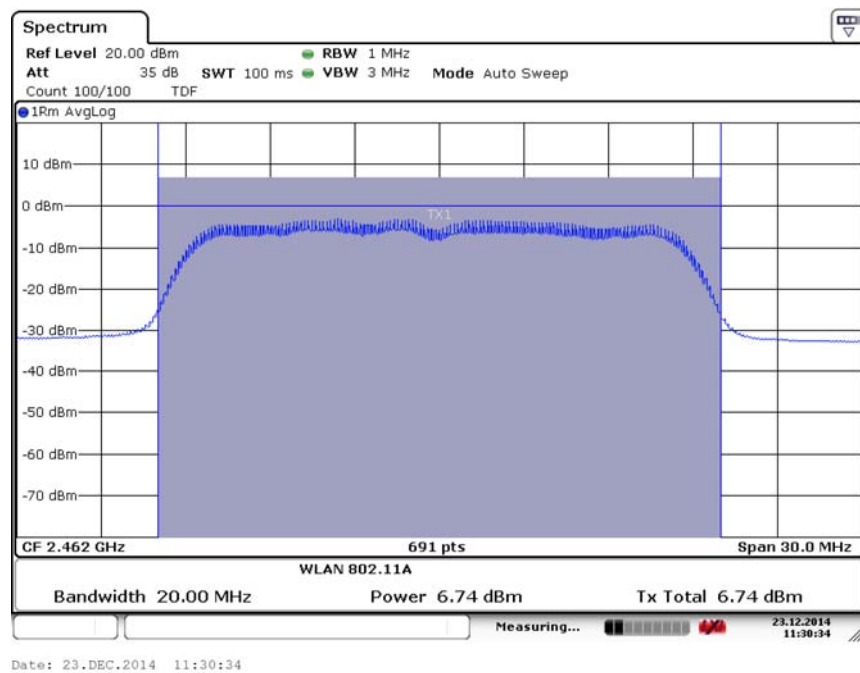


Fig.51 Maximum Average Output Power (802.11n-20MHz, Ch 11,MCS4)

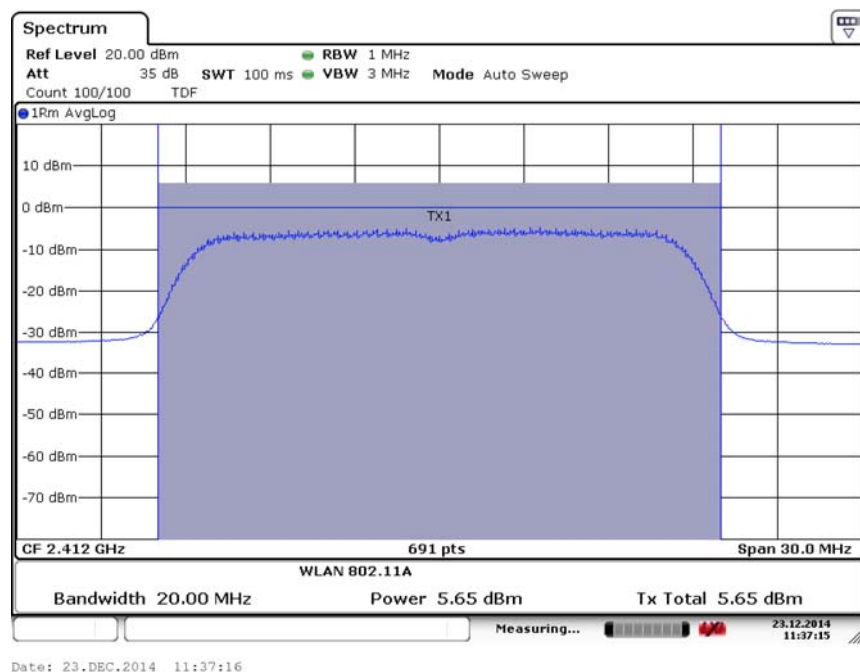


Fig.52 Maximum Average Output Power (802.11n-20MHz, Ch 1,MCS5)

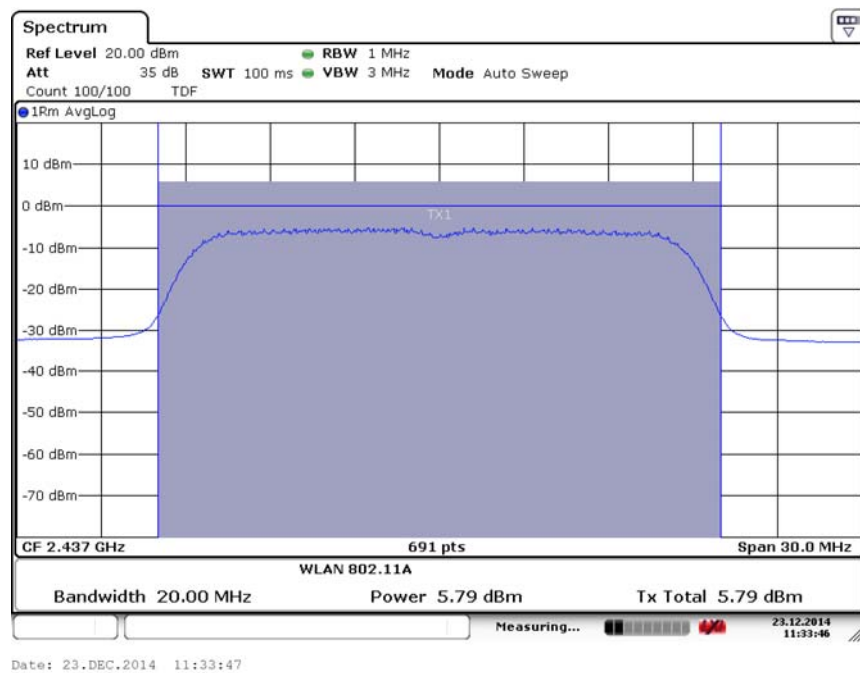


Fig.53 Maximum Average Output Power (802.11n-20MHz, Ch 6,MCS5)

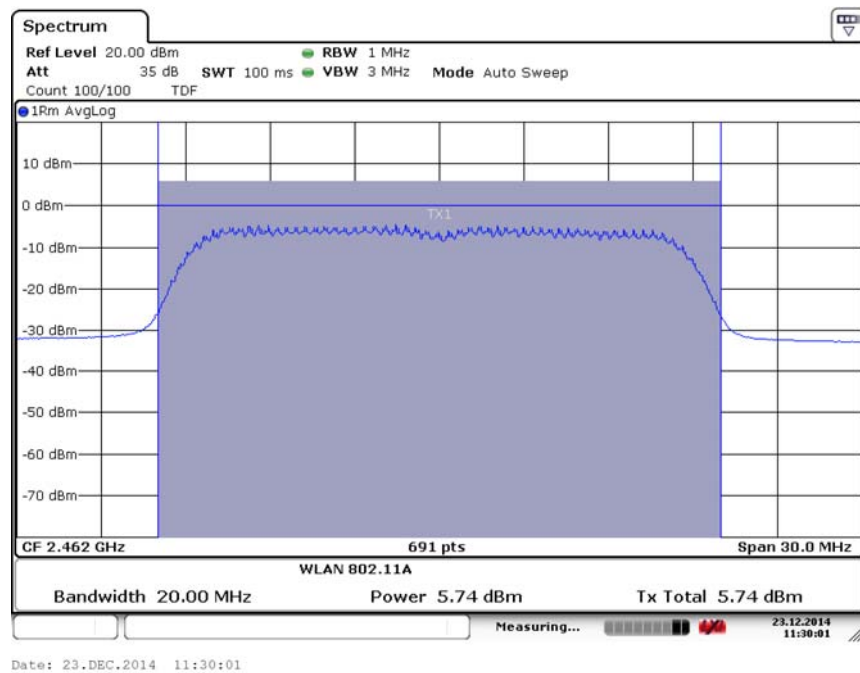


Fig.54 Maximum Average Output Power (802.11n-20MHz, Ch 11,MCS5)

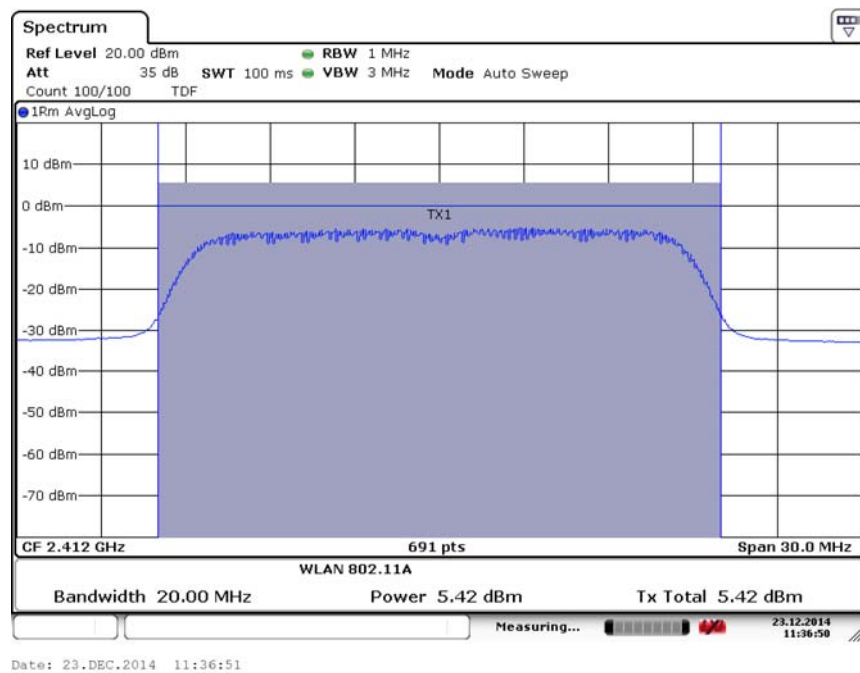


Fig.55 Maximum Average Output Power (802.11n-20MHz, Ch 1,MCS6)

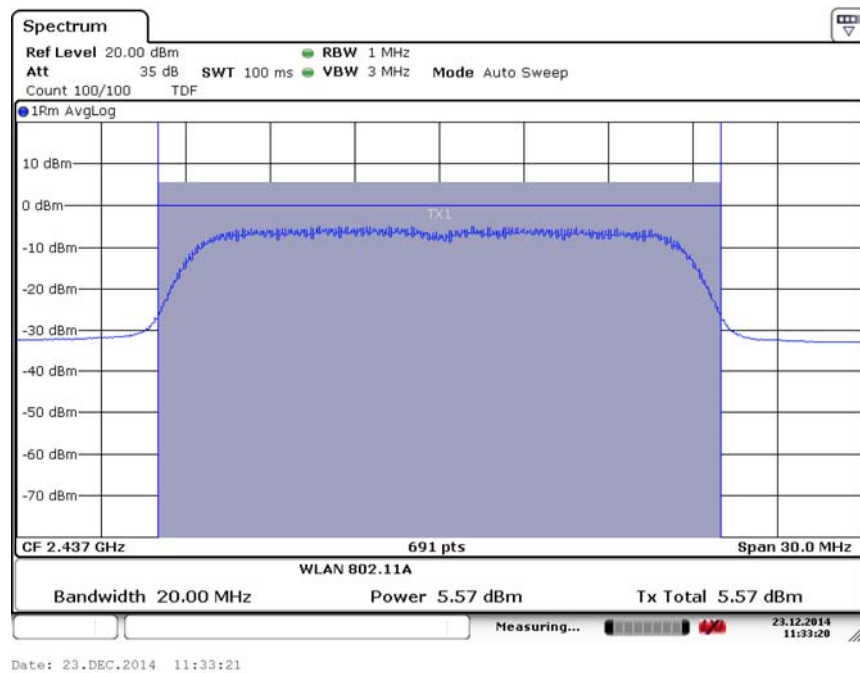


Fig.56 Maximum Average Output Power (802.11n-20MHz, Ch 6,MCS6)

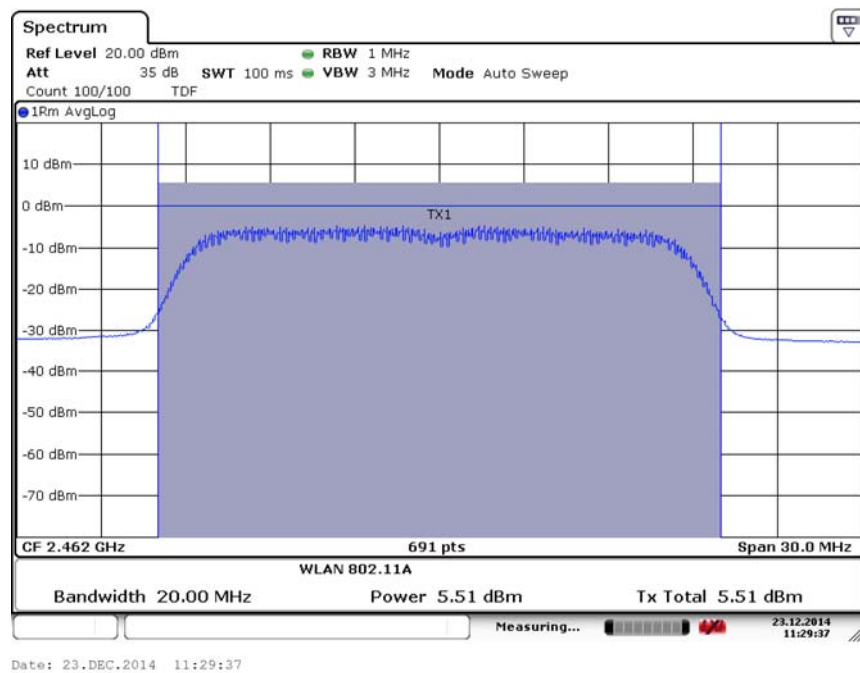


Fig.57 Maximum Average Output Power (802.11n-20MHz, Ch 11,MCS6)

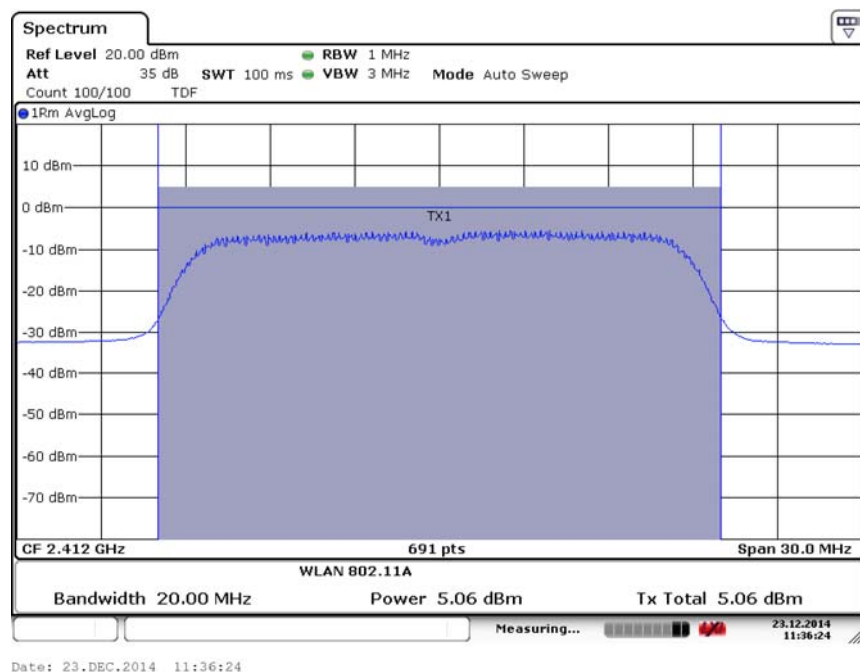


Fig.58 Maximum Average Output Power (802.11n-20MHz, Ch 1,MCS7)

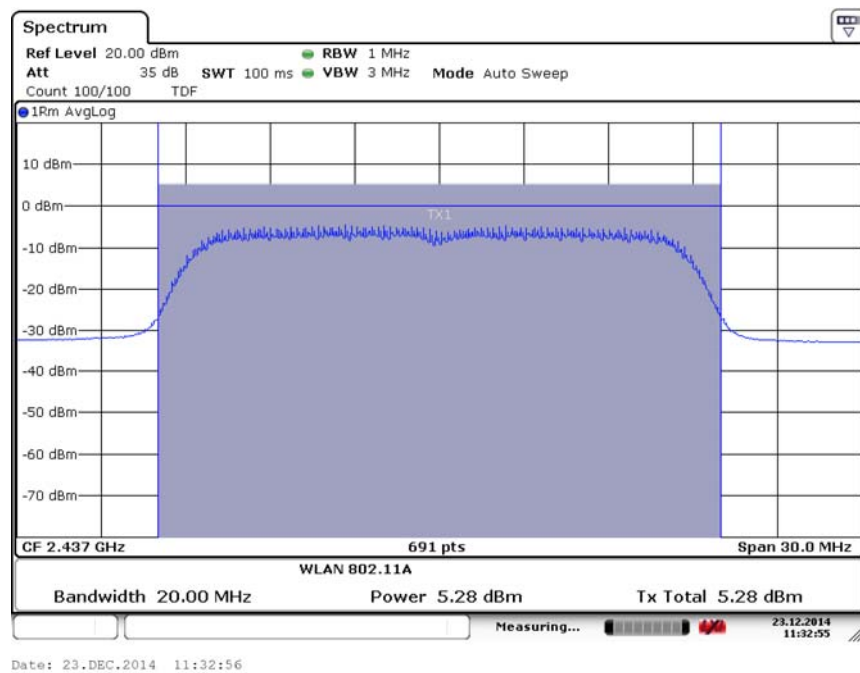


Fig.59 Maximum Average Output Power (802.11n-20MHz, Ch 6,MCS7)

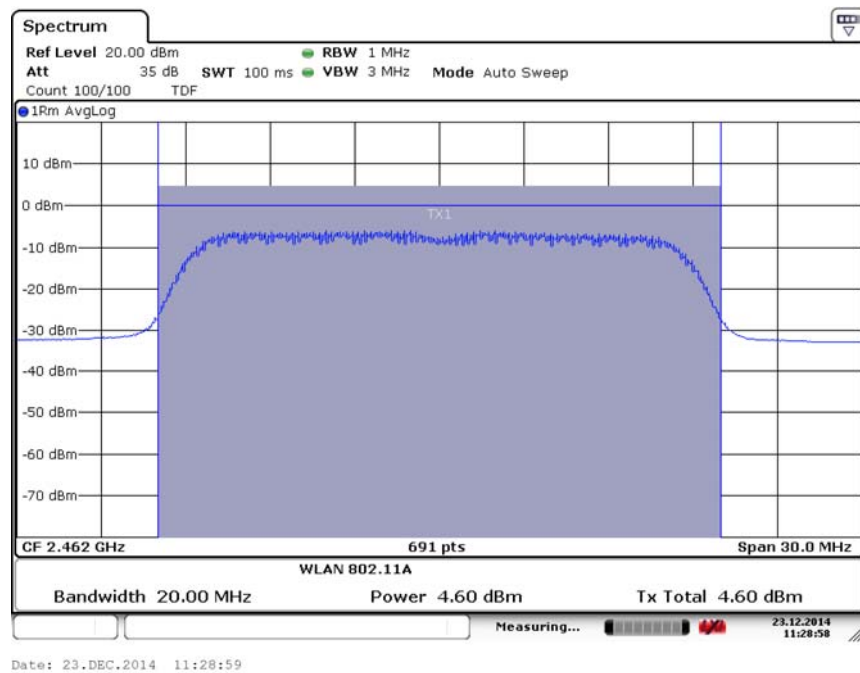


Fig.60 Maximum Average Output Power (802.11n-20MHz, Ch 11,MCS7)

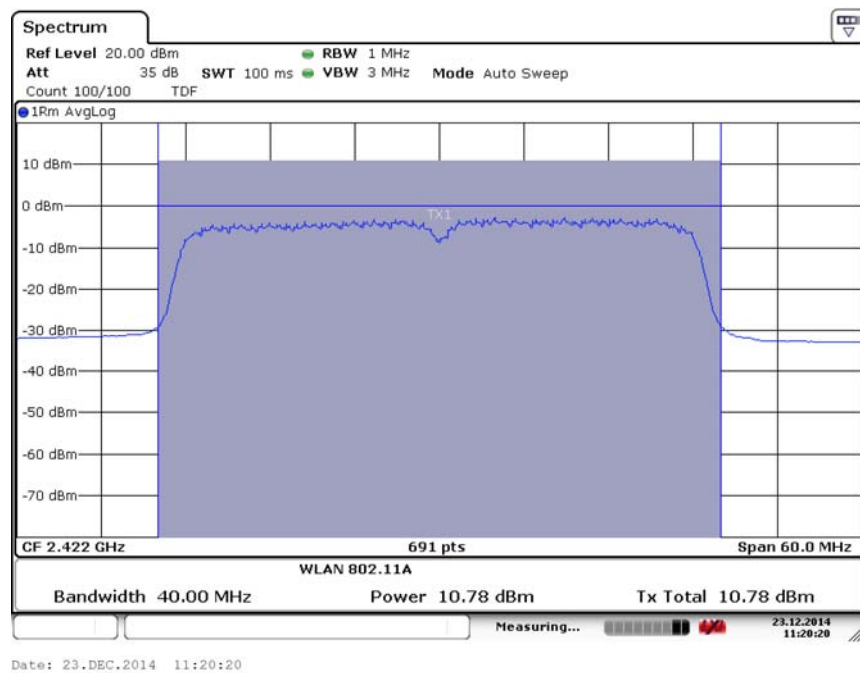


Fig.61 Maximum Average Output Power (802.11n-40MHz, Ch 3,MCS0)

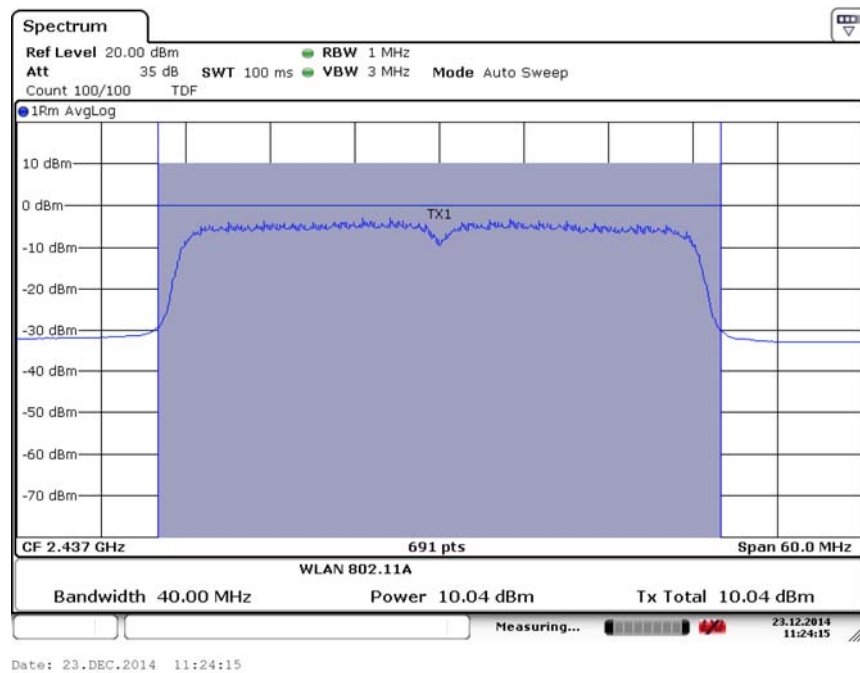


Fig.62 Maximum Average Output Power (802.11n- 40MHz,Ch6,MCS0)

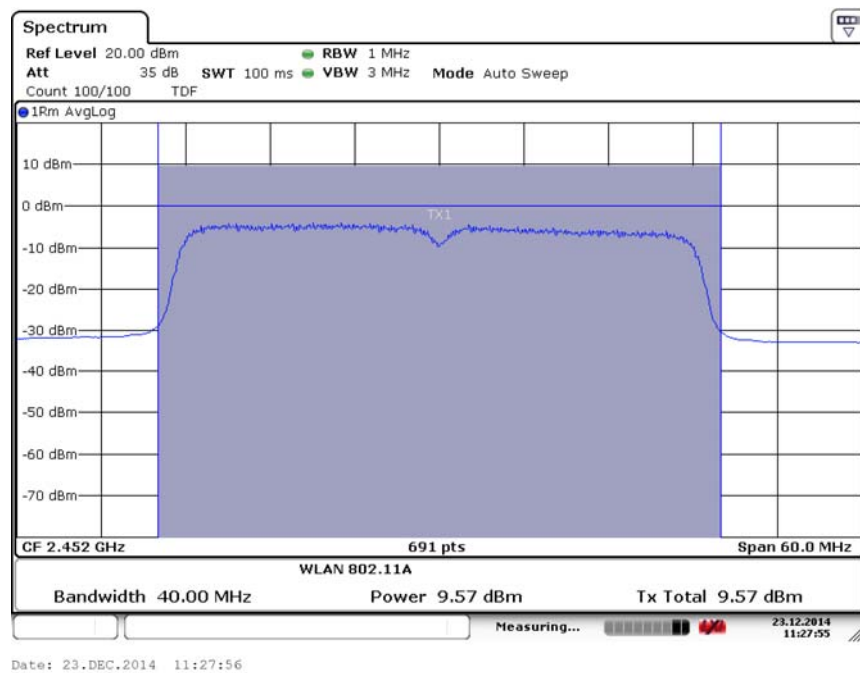


Fig.63 Maximum Average Output Power (802.11n- 40MHz,Ch9,MCS0)

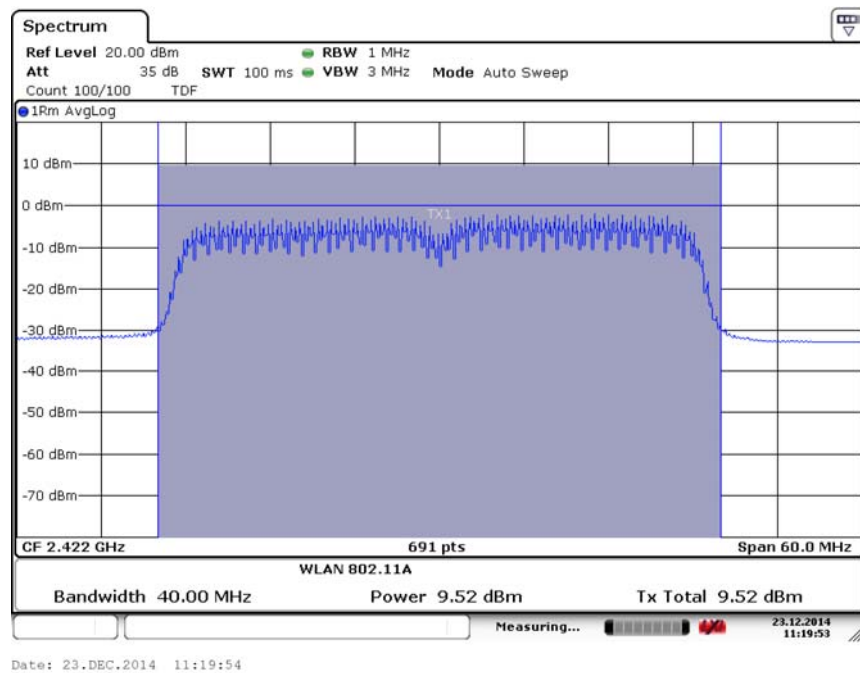


Fig.64 Maximum Average Output Power (802.11n- 40MHz,Ch3,MCS1)