

FCC Part 15E Compliance Test Report

Test Report no.:	FCC15E_RM-1104_44.docx	Date of Report:	21-Oct-2015
Number of pages:	29	Customer's Contact person:	Jari Rontu
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FCC listing no.:	94436		
IC recognition no.:	661AK-1		
Tested devices/ accessories:	Phone RM-1104 / Dummy Battery SD-244R / Headset WH-308		
FCC ID:	PYASTT	IC:	661X-STT
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 15 Subpart E, ANSI C63.4 (2014), DTS procedures KDB 789033 D02 v01, IC standards, RSS-247 (Issue 1, May 2015). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Microsoft.		
Test Results:	The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document		
Date and signature for the contents:			

Timo Raiskio, System Manager, EMC

1. Summary for FCC Part 15E Compliance Test Report

Date of receipt	01-Jul-2015
Testing completed	20-Oct-2015
The customer's contact person	Jari Rontu
Test Plan referred to	T:\Projects\RM-1104\TestPlan\RS_TestPlan_RM-1104_EMCC_FCC.xlsm
Notes	-
Document name	T:\Projects\RM-1104\EMC\FCC15E_RM-1104_44.docx

1.1. EUT and Accessory Information

The EUT is a mobile phone with following features:

GSM/WCDMA/WLAN/Bluetooth

The EUT is tested with maximum rated TX power.

Devices under tests

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-1104	0044027421788866059X034	2012	-	01062.00000.15233.39000	100007
Dummy Battery	SD-244R	-	V.1	-	-	100021
Headset	WH-308	51251B1	-	-	-	100029

1.2. Summary of Test Results

5 GHz RLAN:

Section in CFR 47	Section in RSS-GEN or RSS-247	Name of the test	Result
15.407(a)	6.2	Conducted peak output power	-
15.407(b)	6.2	Band edge compliance of RF emissions	-
15.407(b)	6.2	Spurious radiated emissions	-
15.407(b)(6)	8.8	AC powerline conducted emissions	-
15.407(e)	6.6	6dB(bandwidth)	-
2.1049	6.6	26dB(bandwidth)	-
2.1049	6.6	99%(bandwidth)	X
15.407(a)	6.2	Maximum power spectral density	-
15.407(h)(2)(iii)(a)	A9.3(b)(iii)	Dynamic frequency selection	-

PASSED

FAILED

NP

The EUT complies with the essential requirements in the standard.

The EUT does not comply with the essential requirements in the standard.

The test was not performed by the TCC Microsoft Laboratory.

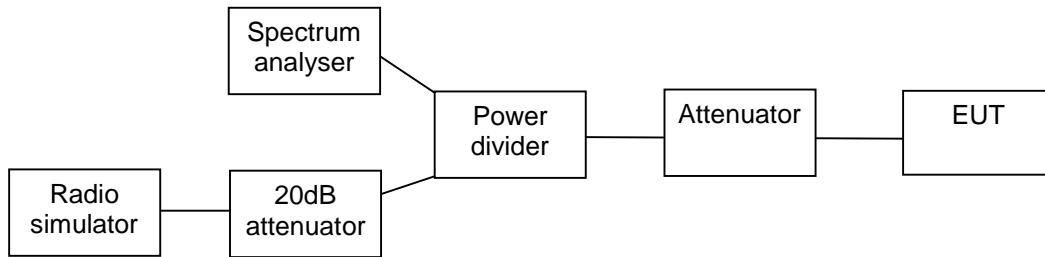
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2. 99%(bandwidth)
(FCC §2.1049, RSS-247 6.6)

EUT with DUT number	RM-1104, DUT 100007
Accessories with DUT numbers	SD-244R, DUT 100021 ; WH-308, DUT 100029
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 35 / 102.4
Date of measurements	20-Oct-2015
Measured by	Timo Raiskio

2.1. Test Setup



2.2. Test method and limit

The measurement is made according to KDB 789033 and RSS-247.

Limits for 99 % bandwidth

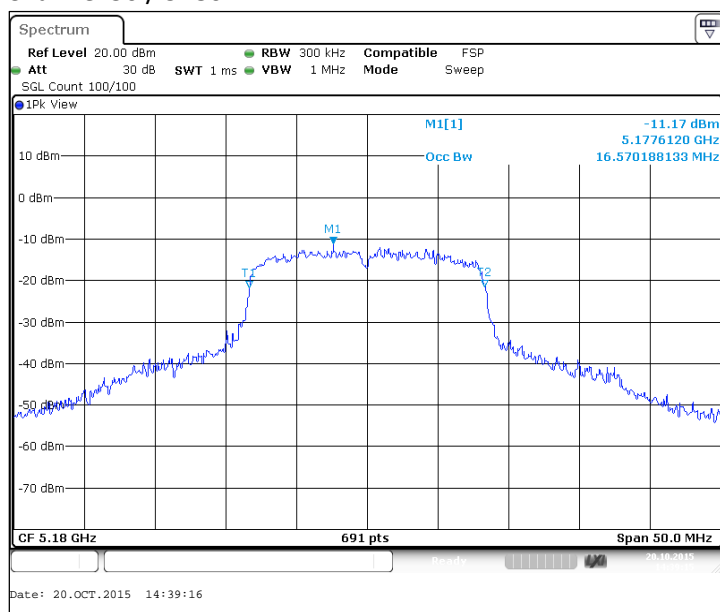
Limit [kHz]
No limit

2.3. 5 GHz RLAN Test results

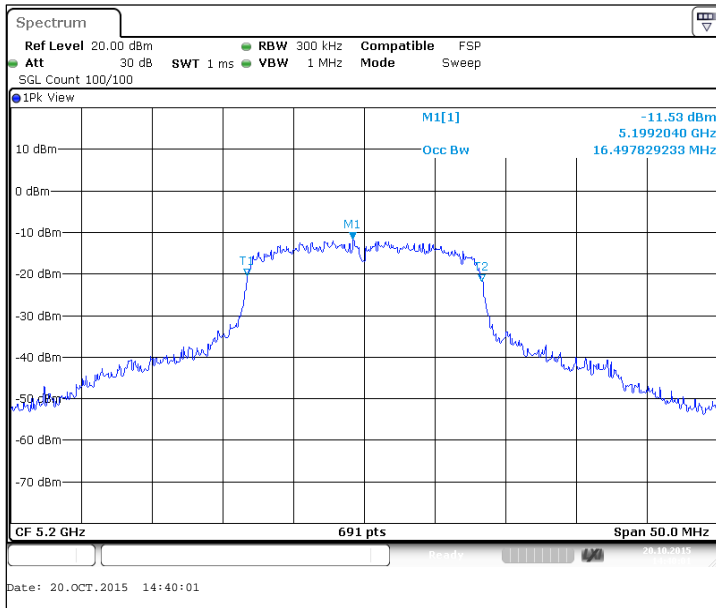
2.3.1 802.11a Main mode, BPSK modulation, 6 Mbps data rate

Channel / f _c [MHz]	99 % bandwidth [kHz]	Result
36 / 5180	16570.2	PASSED
40 / 5200	16497.8	PASSED
48 / 5240	16497.8	PASSED
52 / 5260	16497.8	PASSED
60 / 5300	16425.5	PASSED
64 / 5320	16425.5	PASSED
100 / 5500	16353.1	PASSED
116 / 5580	16280.8	PASSED
140 / 5700	16425.5	PASSED

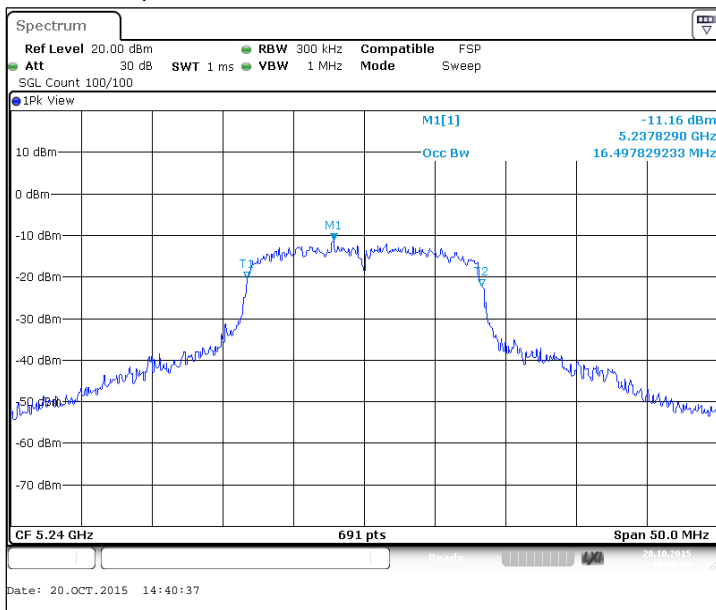
Channel 36 / 5180MHz



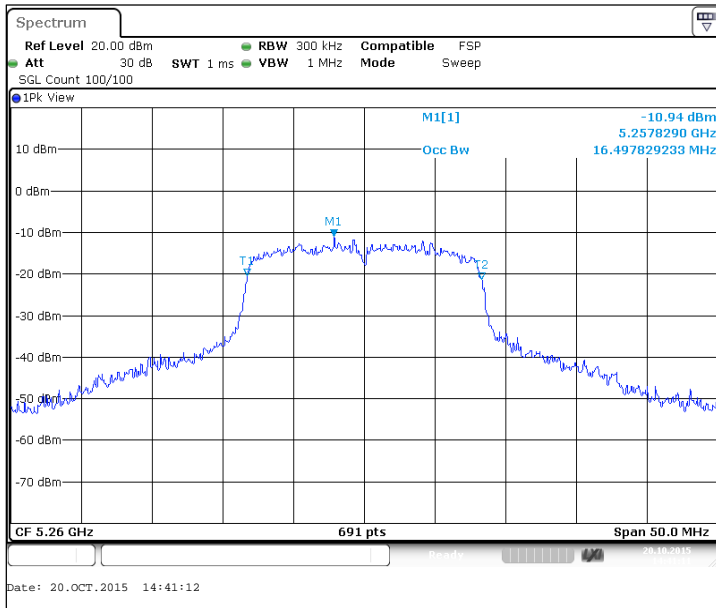
Channel 40 / 5200MHz



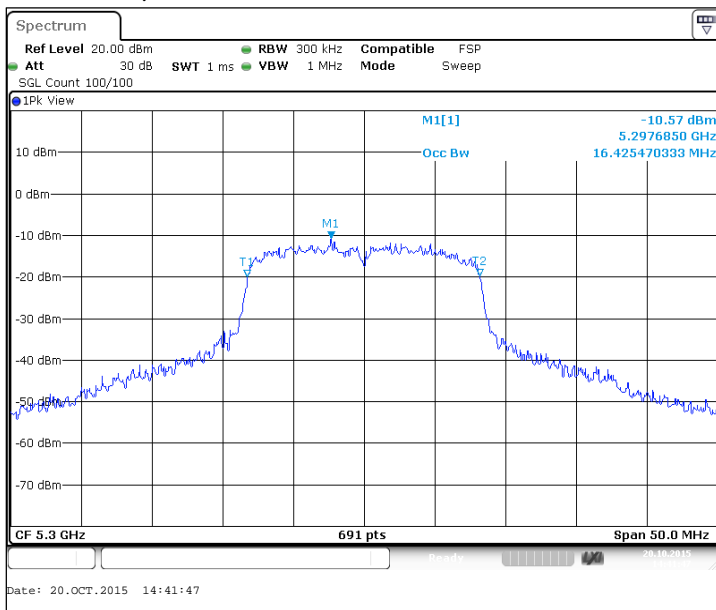
Channel 48 / 5240MHz



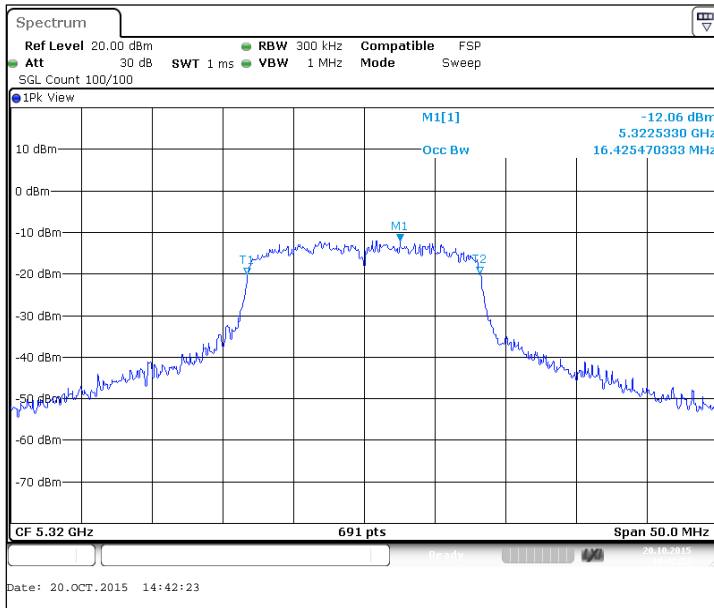
Channel 52 / 5260MHz



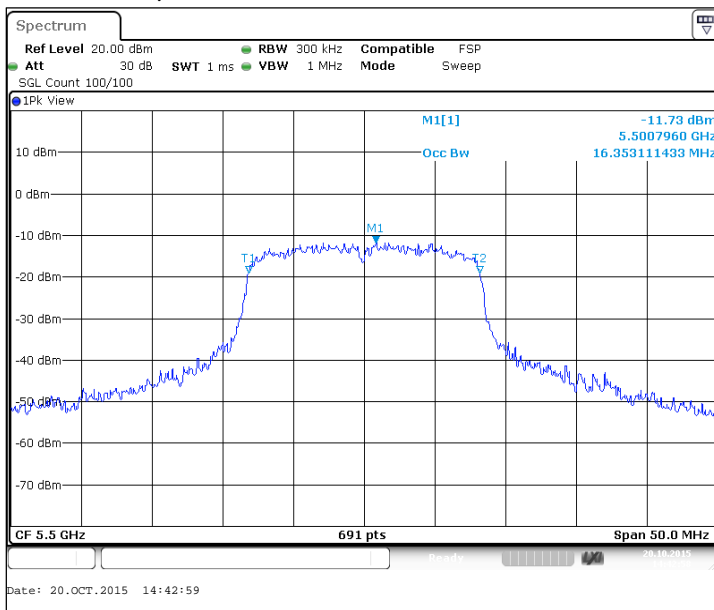
Channel 60 / 5300MHz



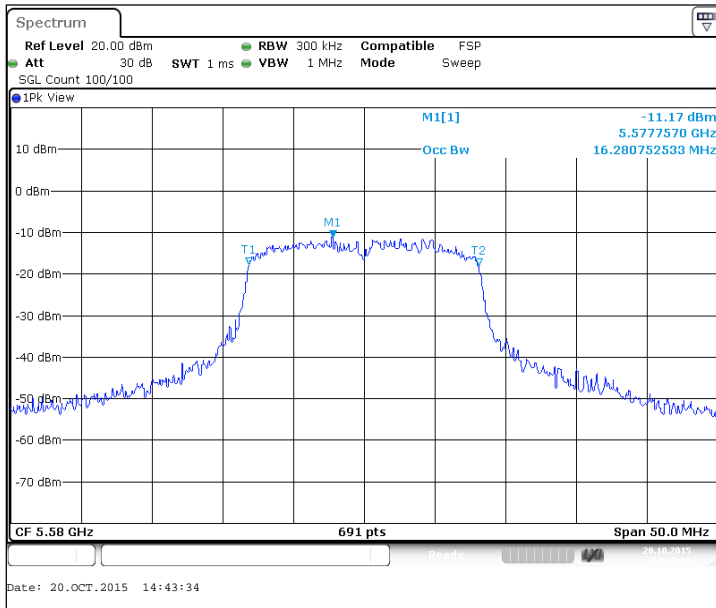
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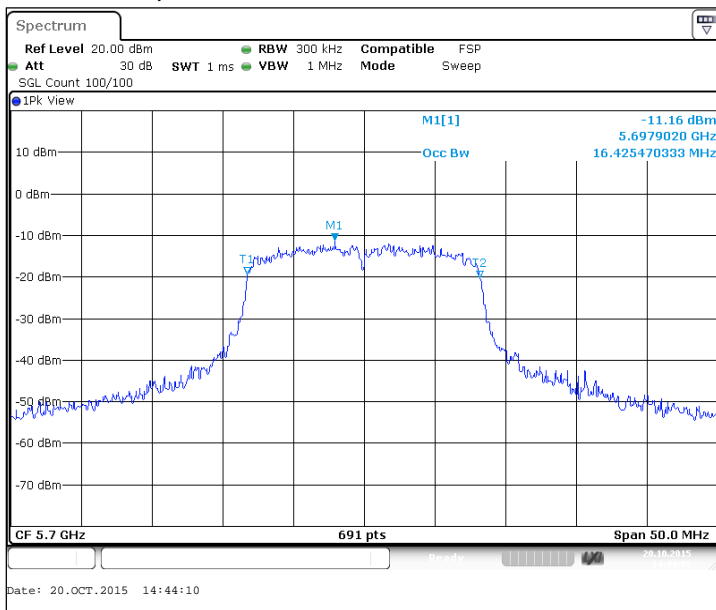
Channel 100 / 5500MHz



Channel 116 / 5580MHz



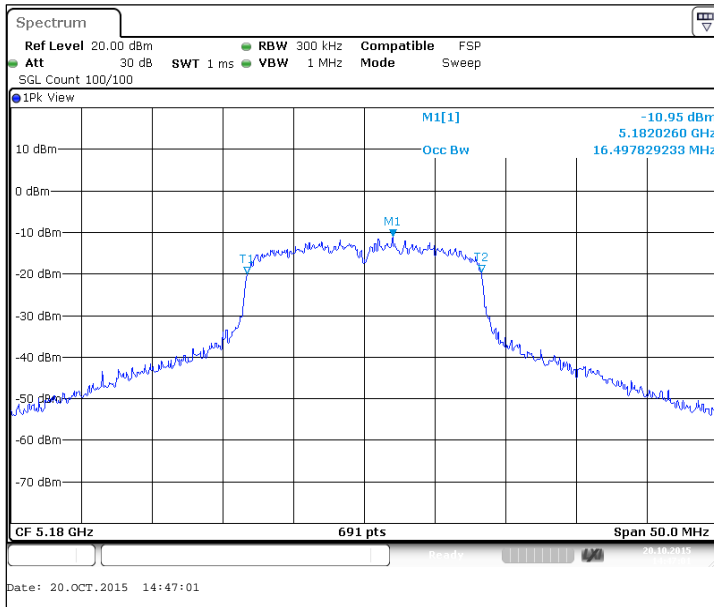
Channel 140 / 5700MHz



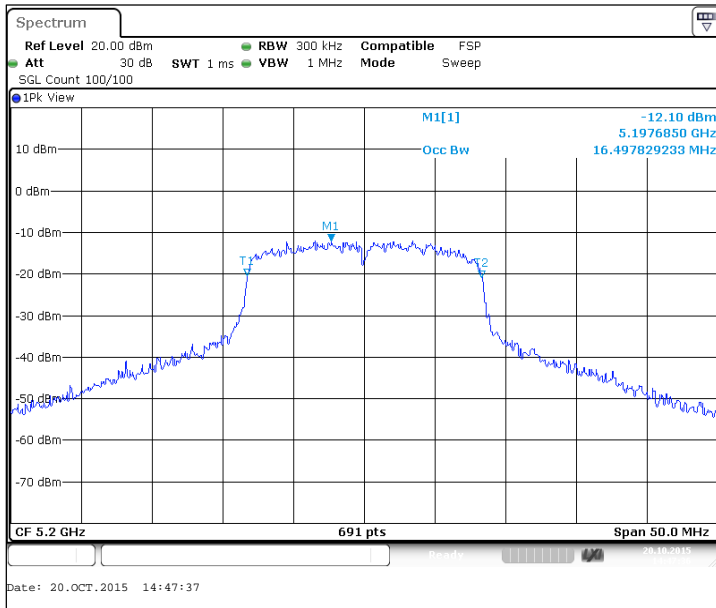
2.3.2 802.11a Main mode, QPSK modulation, 18 Mbps data rate

Channel / f _c [MHz]	99 % bandwidth [kHz]	Result
36 / 5180	16497.8	PASSED
40 / 5200	16497.8	PASSED
48 / 5240	16425.5	PASSED
52 / 5260	16497.8	PASSED
60 / 5300	16497.8	PASSED
64 / 5320	16497.8	PASSED
100 / 5500	16425.5	PASSED
116 / 5580	16425.5	PASSED
140 / 5700	16353.1	PASSED

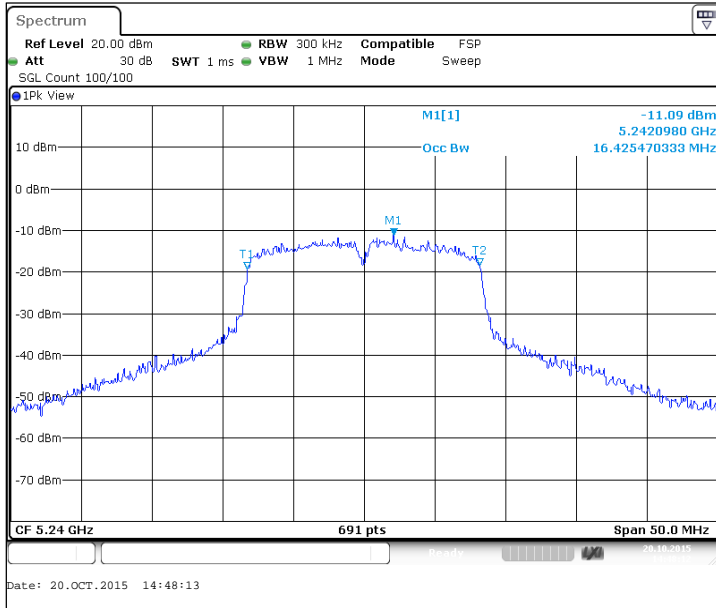
Channel 36 / 5180MHz



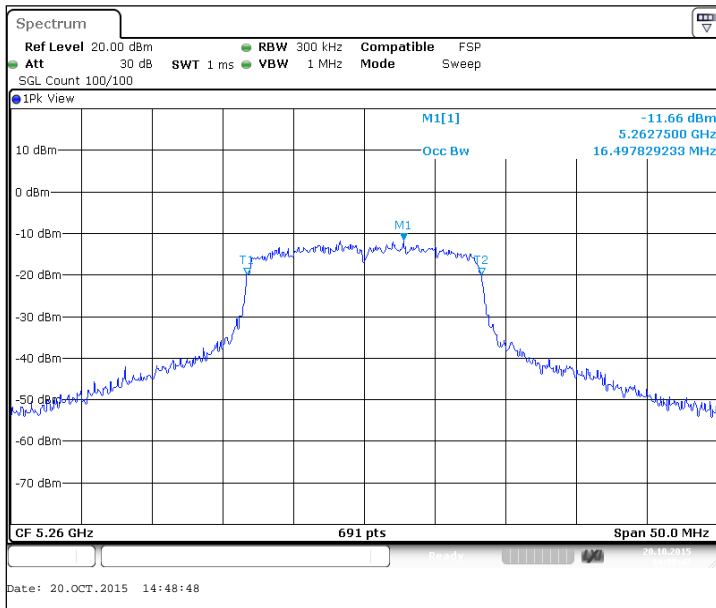
Channel 40 / 5200MHz



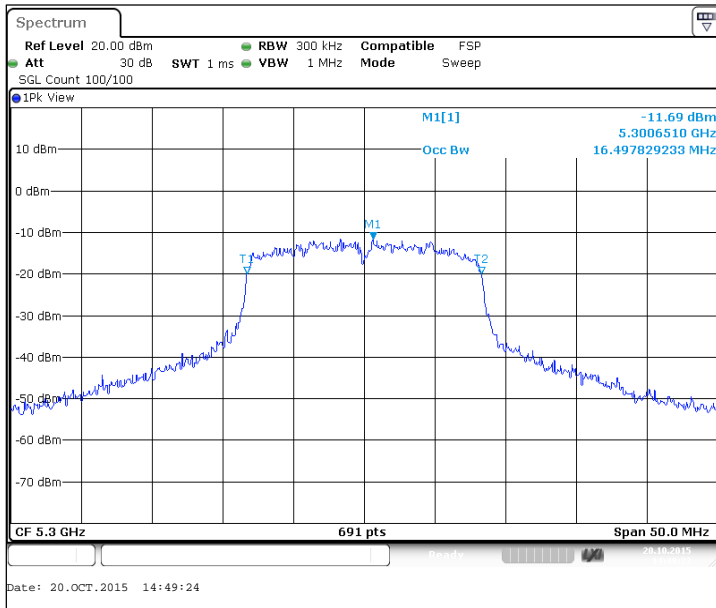
Channel 48 / 5240MHz



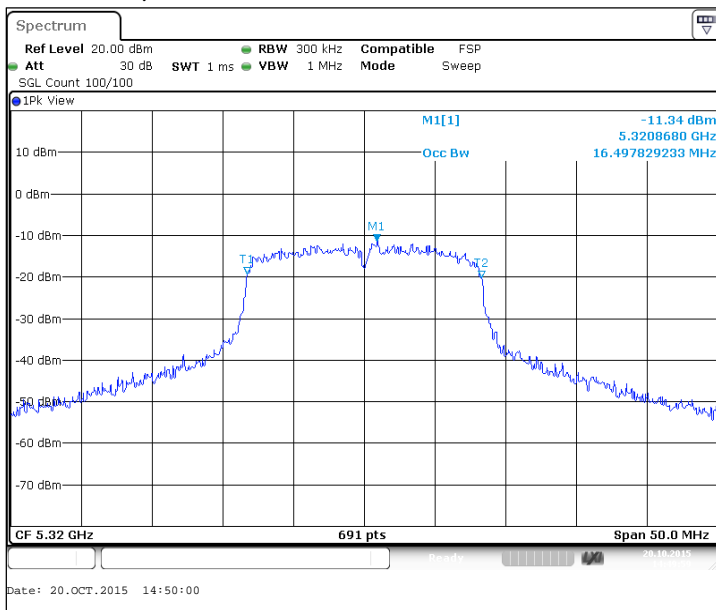
Channel 52 / 5260MHz



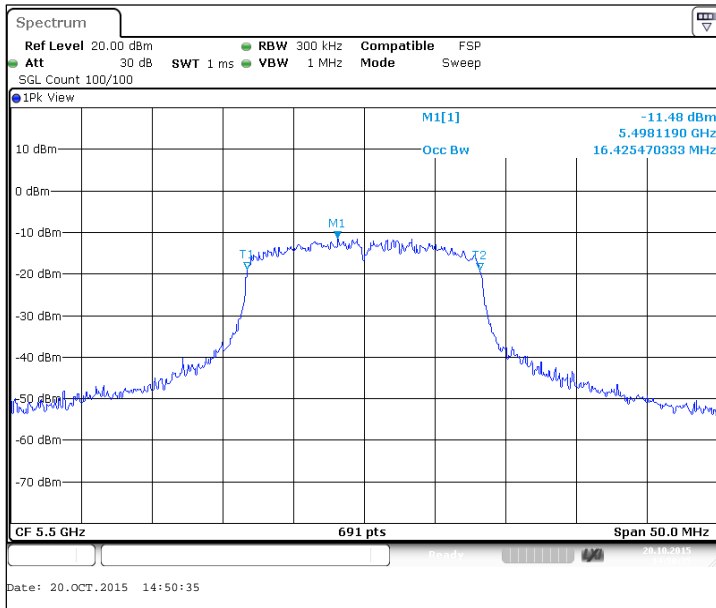
Channel 60 / 5300MHz



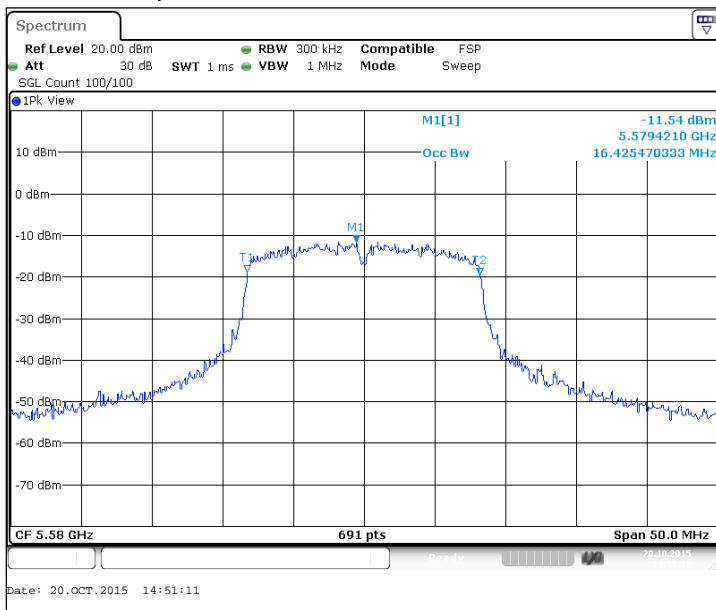
Channel 64 / 5320MHz



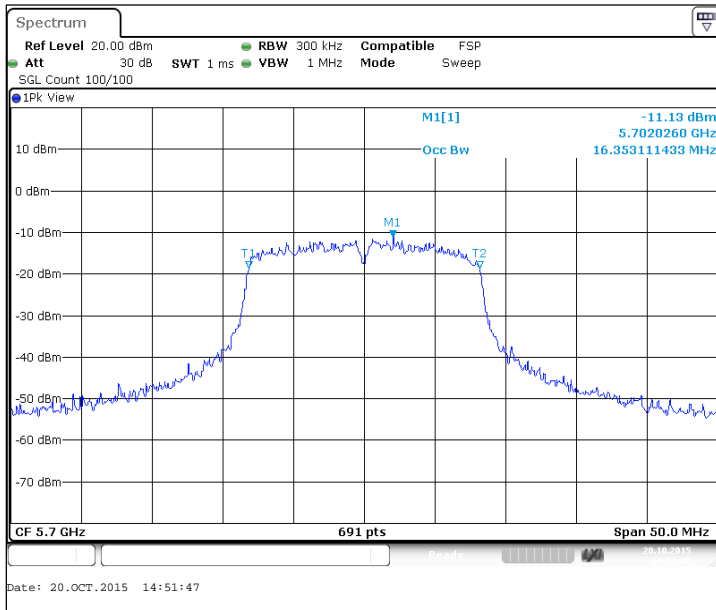
Channel 100 / 5500MHz



Channel 116 / 5580MHz



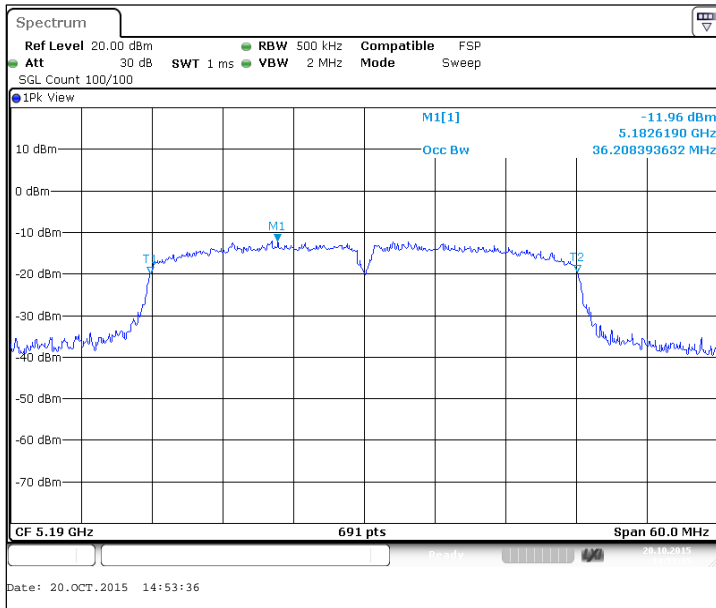
Channel 140 / 5700MHz



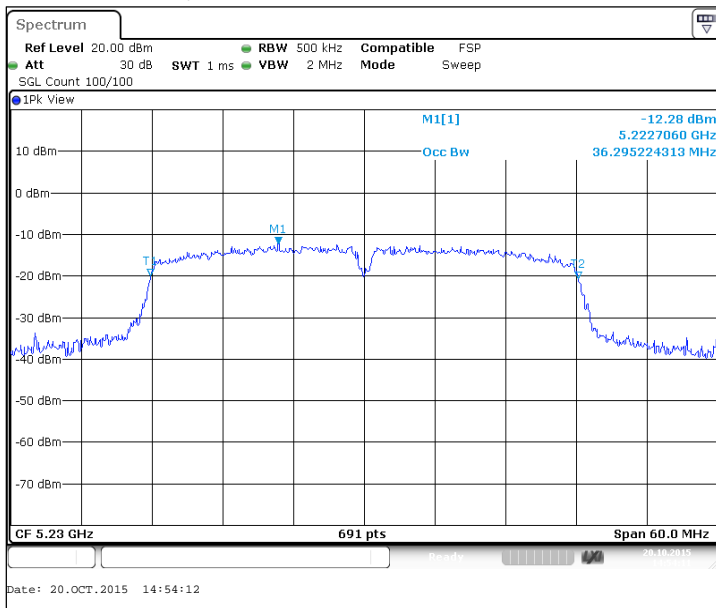
2.3.3 802.11n Main mode, BPSK modulation, 13.5 / 15.0 Mbps data rate

Channel / fc [MHz]	99 % bandwidth [kHz]	Result
36+40 / 5190	36208.4	PASSED
44+48 / 5230	36295.2	PASSED
52+56 / 5270	36121.6	PASSED
60+64 / 5310	36121.6	PASSED
100+104 / 5510	36034.7	PASSED
108+112 / 5550	35947.9	PASSED
132+136 / 5670	35861.1	PASSED

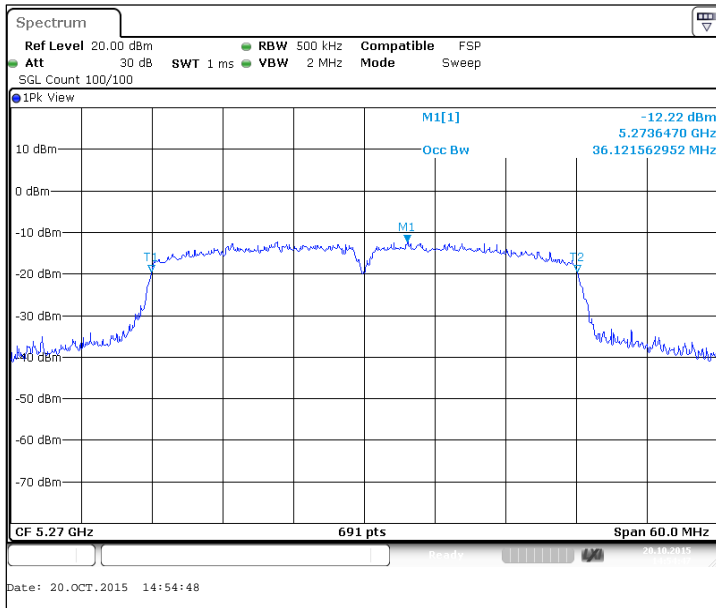
Channel 36+40 / 5190MHz



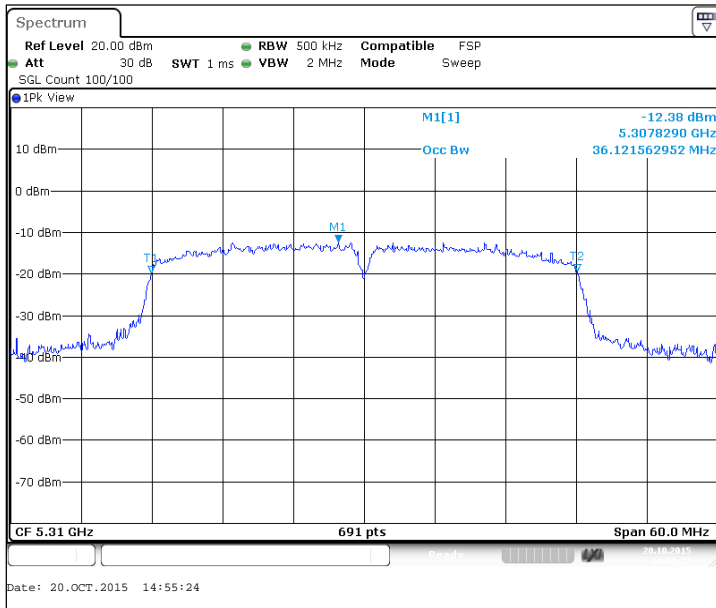
Channel 44+48 / 5230MHz



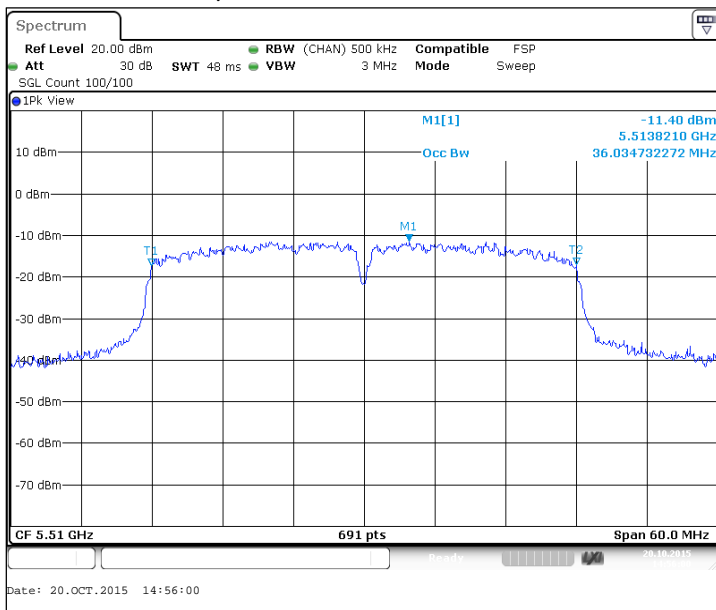
Channel 52+56 / 5270MHz



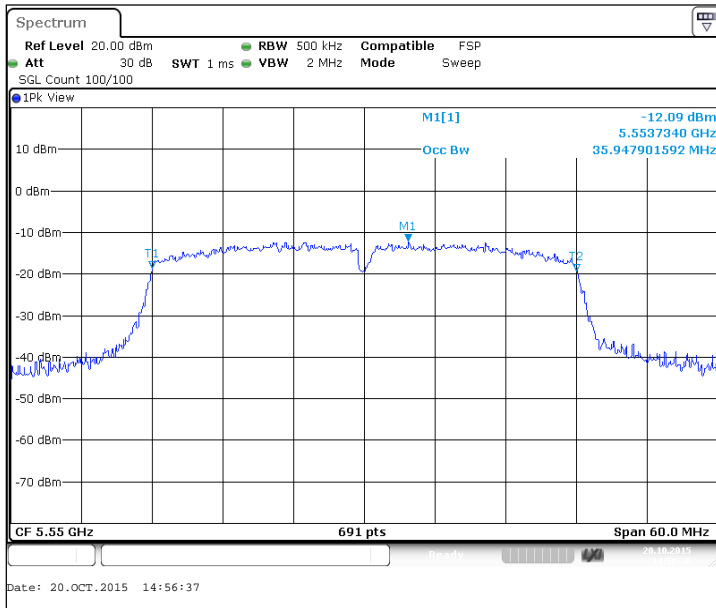
Channel 60+64 / 5310MHz



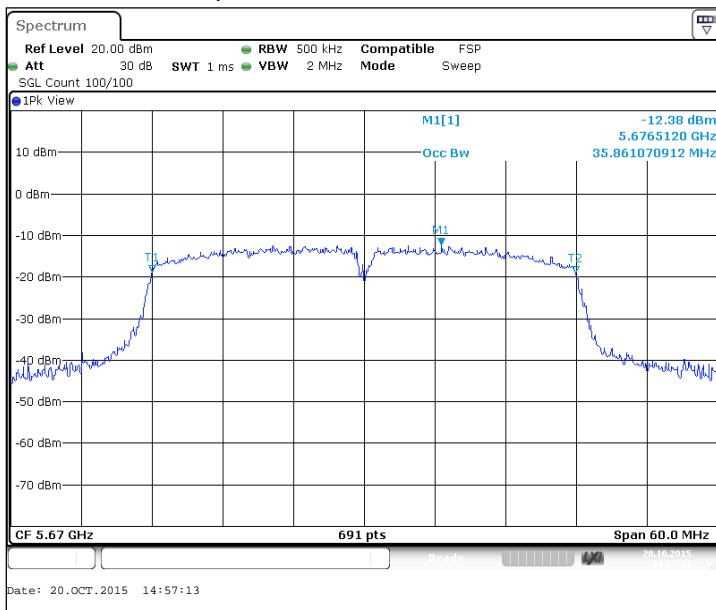
Channel 100+104 / 5510MHz



Channel 108+112 / 5550MHz



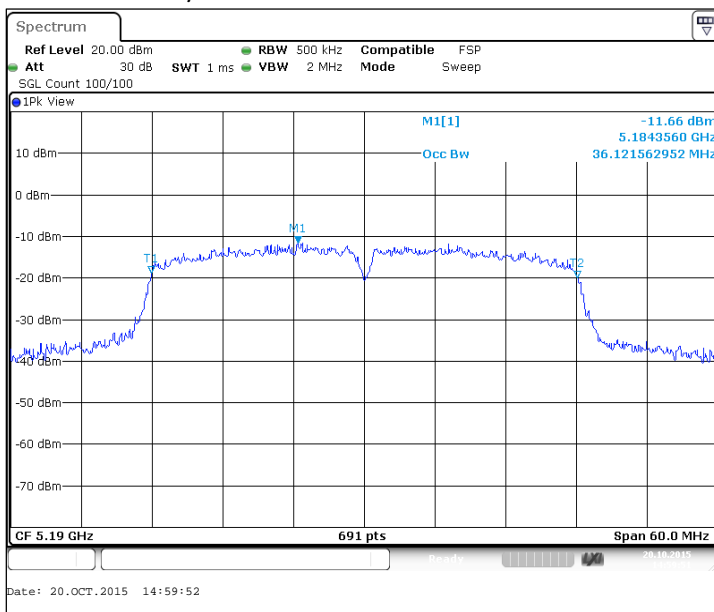
Channel 132+136 / 5670MHz



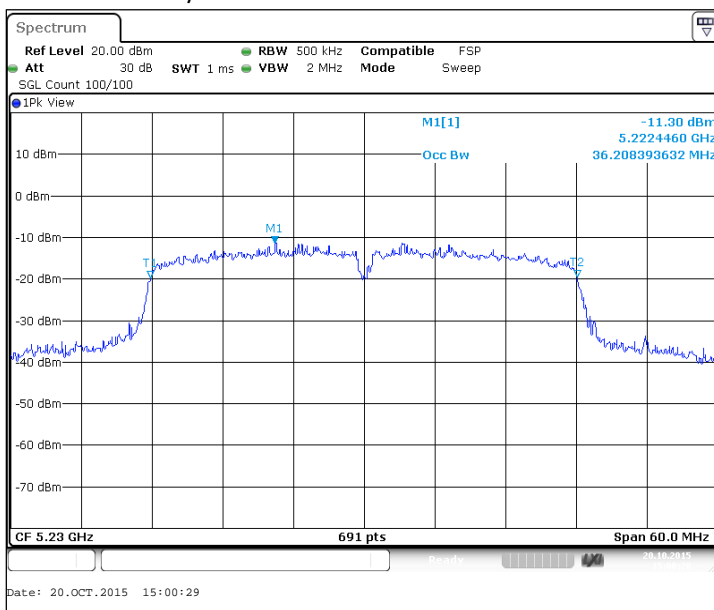
2.3.4 802.11n Main mode, QPSK modulation, 27.0 / 30.0 Mbps data rate

Channel / f _c [MHz]	99 % bandwidth [kHz]	Result
36+40 / 5190	36121.6	PASSED
44+48 / 5230	36208.4	PASSED
52+56 / 5270	36121.6	PASSED
60+64 / 5310	36034.7	PASSED
100+104 / 5510	35861.1	PASSED
108+112 / 5550	35947.9	PASSED
132+136 / 5670	35947.9	PASSED

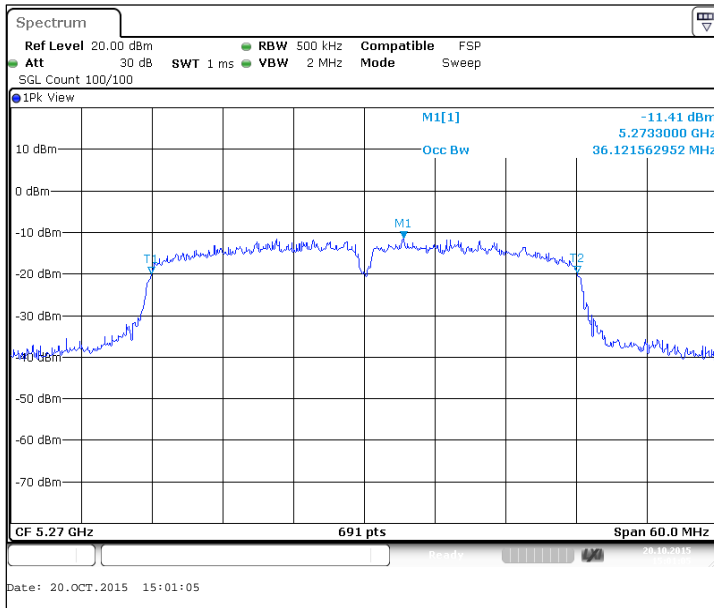
Channel 36+40 / 5190MHz



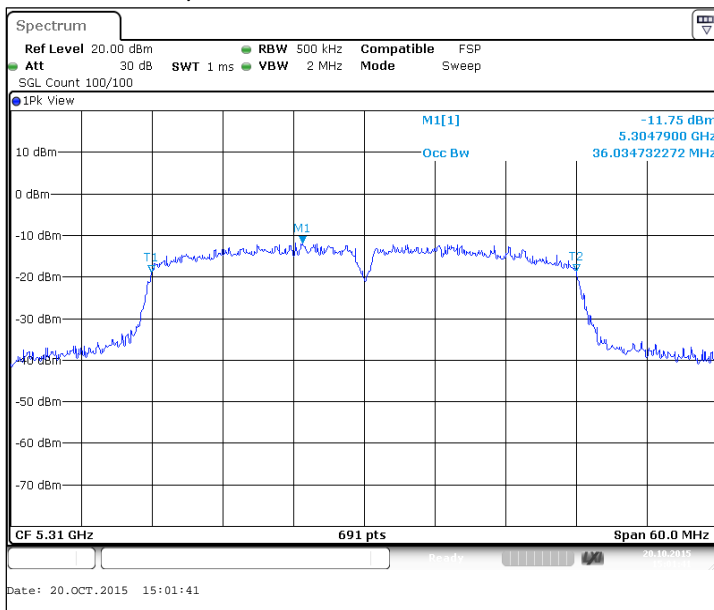
Channel 44+48 / 5230MHz



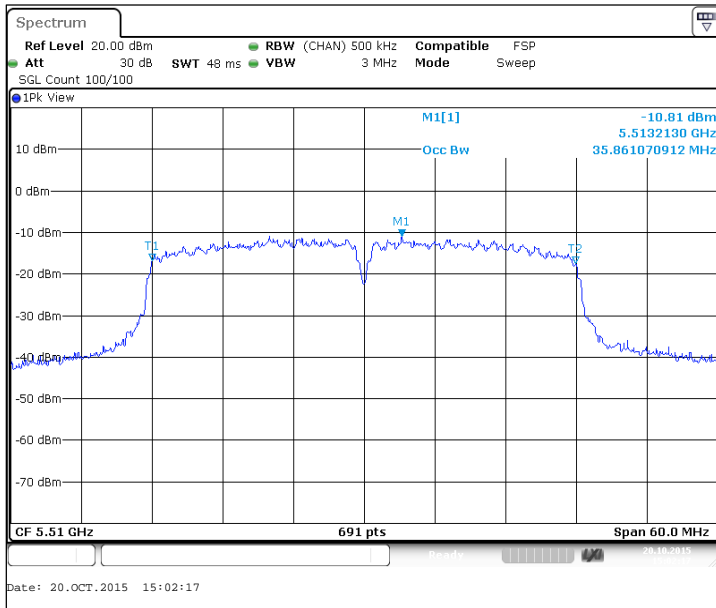
Channel 52+56 / 5270MHz



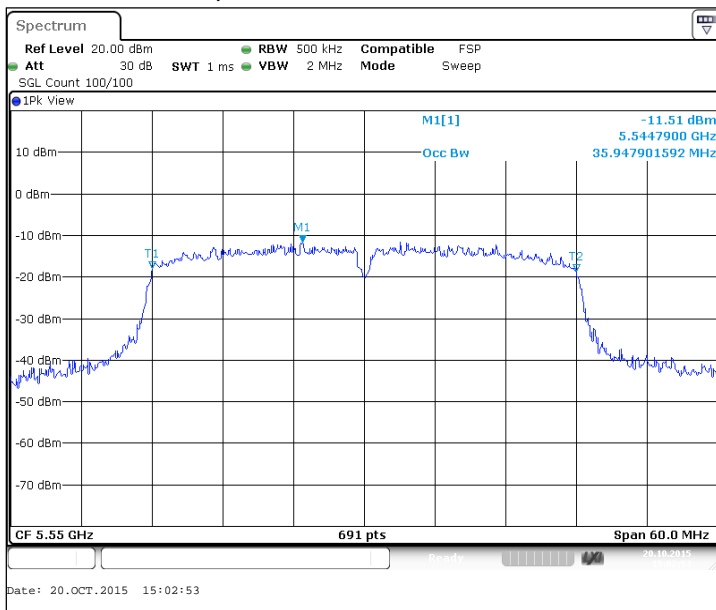
Channel 60+64 / 5310MHz



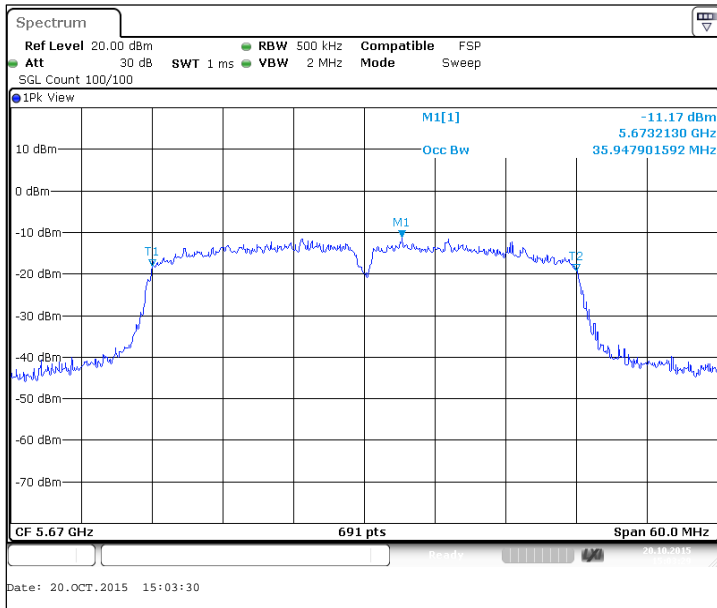
Channel 100+104 / 5510MHz



Channel 108+112 / 5550MHz



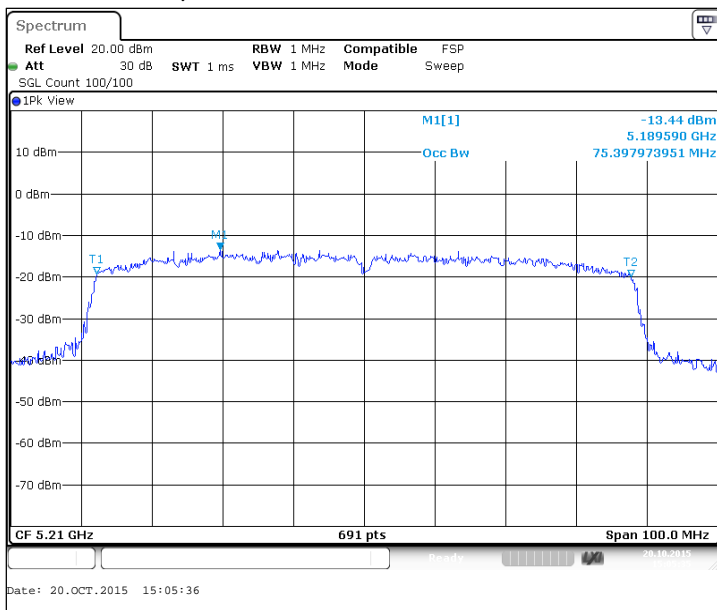
Channel 132+136 / 5670MHz



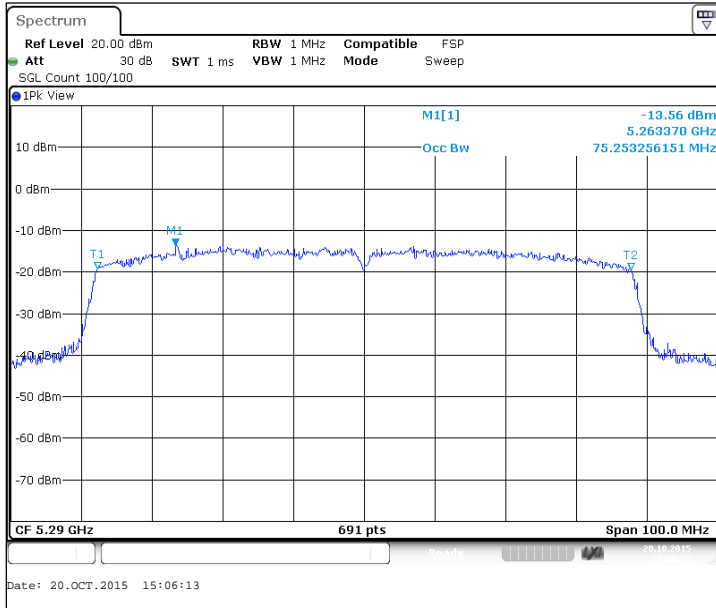
2.3.5 802.11ac Main mode, BPSK modulation, 29.3 / 32.5 Mbps data rate

Channel / fc [MHz]	99 % bandwidth [kHz]	Result
36-48 / 5210	75398	PASSED
52-64 / 5290	75253.3	PASSED
100-112 / 5530	75108.5	PASSED
132-144 / 5690	75253.3	PASSED

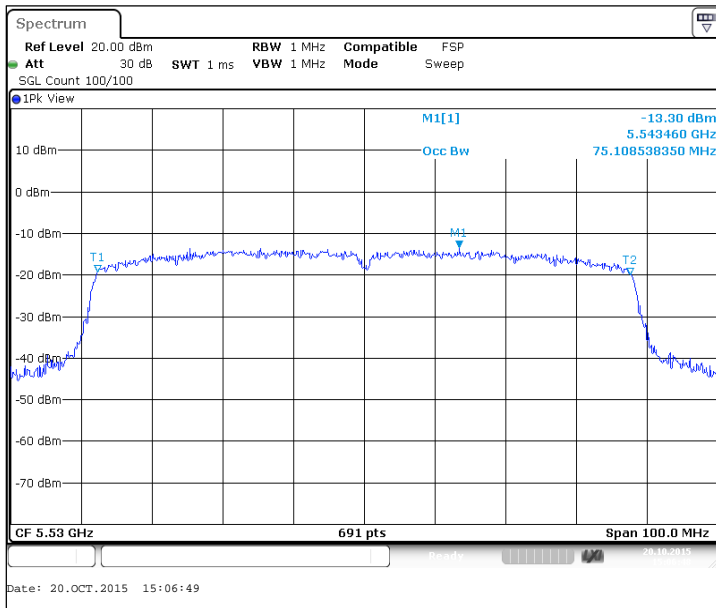
Channel 36-48 / 5210MHz



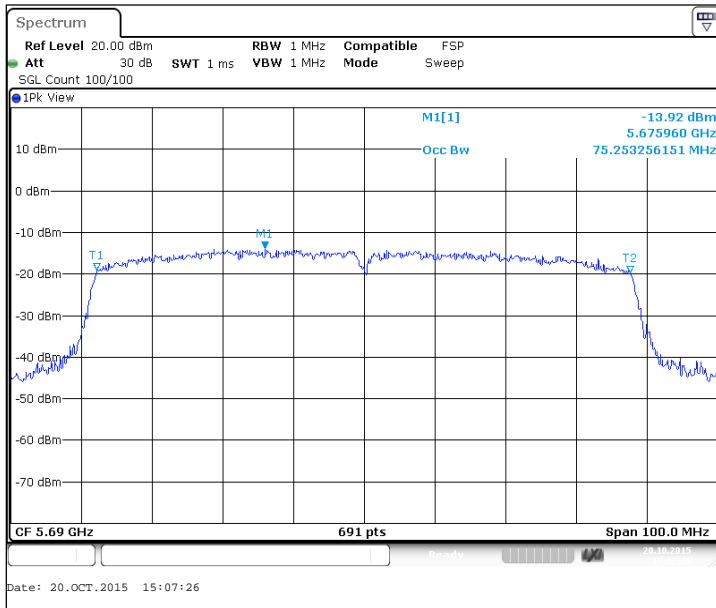
Channel 52-64 / 5290MHz



Channel 100-112 / 5530MHz



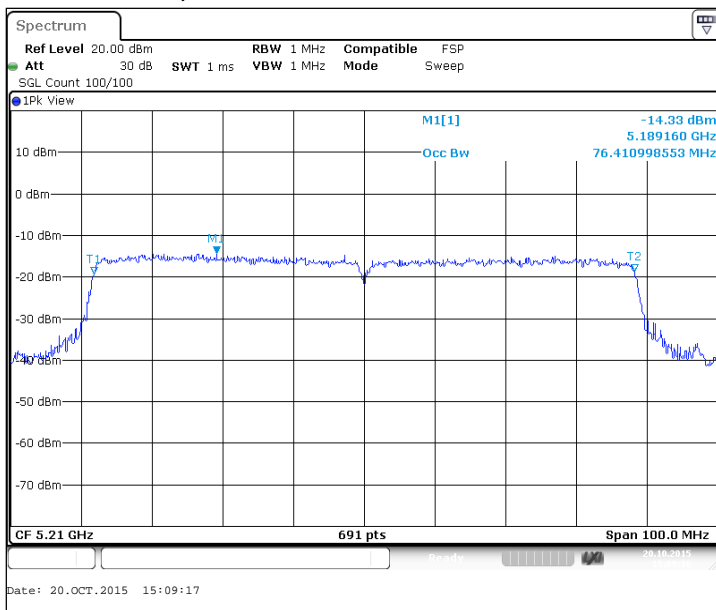
Channel 132-144 / 5690MHz



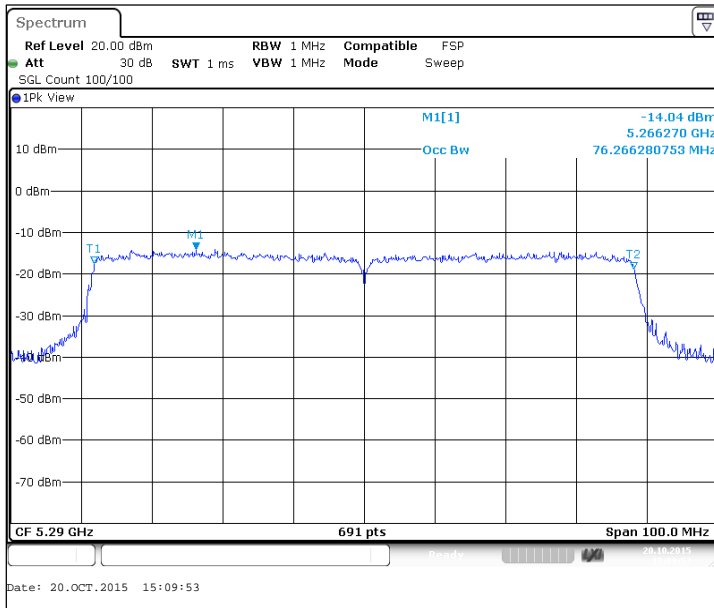
2.3.6 802.11ac Main mode, 16QAM modulation, 175.5 / 195.0 Mbps data rate

Channel / fc [MHz]	99 % bandwidth [kHz]	Result
36-48 / 5210	76411	PASSED
52-64 / 5290	76266.3	PASSED
100-112 / 5530	76411	PASSED
132-144 / 5690	76266.3	PASSED

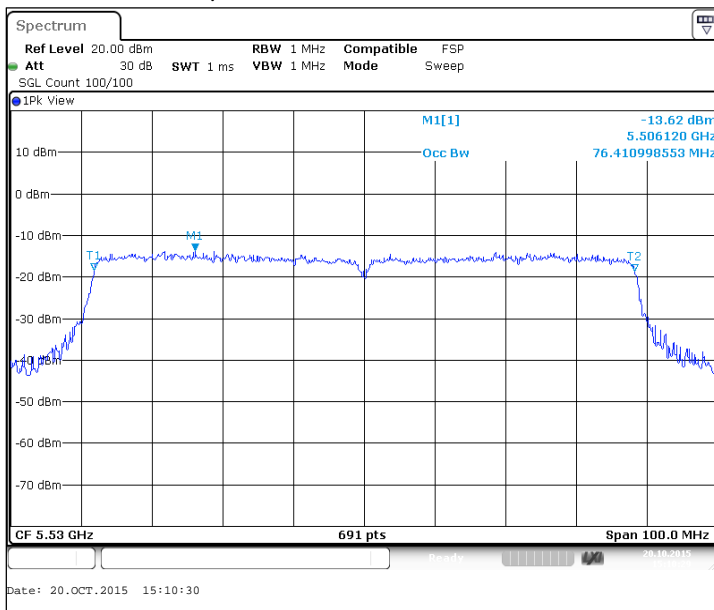
Channel 36-48 / 5210MHz



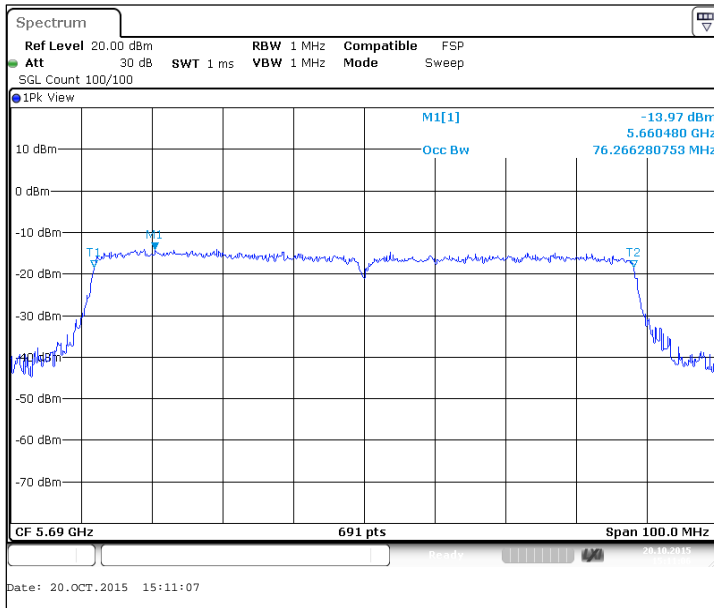
Channel 52-64 / 5290MHz



Channel 100-112 / 5530MHz



Channel 132-144 / 5690MHz



3. Test Equipment

3.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM350089	Power supply	6632A	Agilent	22/24/27, 15C, 15E
TM350090	Power supply	6632A	Agilent	22/24/27, 15C, 15E
TM30600	Impulse limiter	ESH3-Z2	R&S	15C, 15B
TM490017	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM490018	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM150128	Spectrum Analyzer	FSU26	R&S	22/24/27, 15C, 15E
TM23007	Oscilloscope	TDS684B	Tektronix	15E
TM22806	Battery	BAT 20/E	Fiskars	15C, 15B
TM22805	UPS	PS 20/1.2	Fiskars	15C, 15B
-	Temperature and humidity logger	175-H2	Testo	15C, 15B
-	Temperature and humidity logger	175-H2	Testo	22/24/27, 15C
-	Air pressure and temperature logger	635-2	Testo	22/24/27, 15C, 15B
-	Air pressure sensor	0638-1835	Testo	22/24/27, 15C, 15B
-	Temperature test chamber	VT 4002	Vötsch	22/24/27
2001	Bluetooth tester	CBT	R&S	15C, 15B
2009	LISN 50 µH	ENV216	R&S	15C, 15B
2010	LISN 50 µH	ENV216	R&S	15C, 15B
2012	Power splitter	11667B	Agilent	22/24/27, 15C
2013	Attenuator	8493C	Agilent	22/24/27, 15C
2014	Attenuator	8493C	Agilent	22/24/27, 15C
2019	Power splitter	ZN2PD-9G-S+	Mini-Circuits	15E
2020	Power splitter	ZN2PD-9G-S+	Mini-Circuits	15E
TM210166	Communication Tester	CMW500	R&S	22/24/27
TM210205	Communication Tester	CMU200	R&S	22/24/27
2023	Spectrum Analyzer	ESMI-RF	R&S	15B/15C
2024	Analyzer display unit	ESAI-D	R&S	15B/15C
TM110070	Signal Generator	SMF 100A	R&S	22/24/27, 15C, 15E, 15B
TM220065	Bluetooth tester	CBT	R&S	15C, 15B
TM210330	Communication Tester	CMU200	R&S	22/24/27, 15B
TM150131	Spectrum Analyzer	FSP30	R&S	22/24/27, 15C, 15E
TM210049	Communication Tester	CMU200	R&S	22/24/27

3.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
-	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C
TM38845	Receiver	ESIB 26	R&S	22/24/27, 15C, 15E, 15B
-	Antenna	HL562	R&S	22/24/27, 15C, 15E, 15B
-	Turntable	2188	EMCO	22/24/27, 15C, 15E, 15B
-	Turntable controller	2090	EMCO	22/24/27, 15C, 15E, 15B
-	RF system panel	OSP130	R&S	22/24/27, 15C, 15E, 15B
-	Mini mast	2075-2	ETS Lindgren	22/24/27, 15C, 15B
TM38843	Mini mast	2075	Emco	22/24/27, 15C, 15B
TM38842	Antenna mast controller	2090	Emco	22/24/27, 15C, 15B
TM30643	LISN 50 µH	LISN-5-20-2	FCC	22/24/27, 15C, 15B
TM30644	LISN 50 µH	LISN-5-20-2	FCC	22/24/27, 15C, 15B

Eq. No	Equipment	Type	Manufacturer	Used in
-	Temperature and humidity logger	175-H2	Testo	22/24/27, 15C, 15B
-	Air pressure and temperature logger	635-2	Testo	22/24/27, 15C, 15B
-	Air pressure sensor	0638-1835	Testo	22/24/27, 15C, 15B
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	Miteq	22/24/27, 15C, 15B
TM37498	Preamplifier	AMF-5D-020180-26-10P	Miteq	22/24/27, 15C, 15B
TM30599	Semi anechoic chamber	UNKNOWN	TDK	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	-	22/24/27, 15C, 15E, 15B
TM38066	High pass filter	WHKX3.0/18G-12SS	Wainwright	22/24/27, 15C, 15E, 15B
2028	High pass filter	WHKX 1.0/15G-12SS	Wainwright	22/24/27, 15C, 15E, 15B
TM37545	Tunable notch filter	800.0/960.0-0.2/40-8SSK	Wainwright	22
TM26512	Tunable notch filter	WRCD1850/1910-0.2/40-10SSK	Wainwright	24
-	Band reject filter	WRCG1877/1883-1870/1890-40/6EE	Wainwright	24
-	Band reject filter	WRCG1729.4/1735.4-1722.4/1742.4-40/6SS	Wainwright	27
TM23892	Controller	G-1000SDX	Yaesu	22/24/27, 15C, 15E
2001	Bluetooth tester	CBT	R&S	15C, 15B
TM210203	Communication Tester	CMU200	R&S	22/24/27, 15B
6023	Antenna	VUBA 9117	Schwarzbeck	22/24/27
TM210166	Communication Tester	CMW500	R&S	22/24/27
2025	Antenna	HFH2-Z2	R&S	15C
TM110070	Signal Generator	SMF 100A	R&S	22/24/27, 15C, 15E, 15B
2052	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C, 15B, 15E
-	Antenna	QSH18S20	Q-Par	22/24/27, 15C, 15B, 15E
-	Antenna	QSH20S20	Q-Par	22/24/27, 15C, 15B, 15E
-	Antenna	QSH20S20	Q-Par	22/24/27, 15C, 15B, 15E
TM220065	Bluetooth tester	CBT	R&S	15C, 15B

END OF REPORT