

FCC Part 15C Compliance Test Report

Test Report no.:	FCC15CWLAN_RM-893_10.docx	Date of Report:	20-May-2013
Number of pages:	82	Customer's Contact person:	Jari Rontu
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FCC listing no.:	533467		
IC recognition no.:	661V-1		
Tested devices/ accessories:	Phone RM-893 / Headset WH-208 / Battery BL-4YW / AC-Charger AC-50		
FCC ID:	PYAA	IC:	661V-A1
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2003), DTS procedures KDB 558074, IC standards. 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 Nokia.		
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:			

Sami Lehtonen, Specialist, EMC

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	18-Apr-2013
Testing completed	02-May-2013
The customer's contact person	Jari Rontu
Test Plan referred to	T:\Projects\RM-892\TestPlan\RS_testplan_RM-892_EMC_FCC_SAR.xlsm
Notes	-
Document name	T:\Projects\RM-893\EMC\FCC15CWLAN_RM-893_10.docx

1.1. EUT and Accessory Information

The EUT is a mobile phone with following features:

GSM/WCDMA/WLAN

The EUT is tested with maximum rated TX power.

Devices under tests

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-892	004402472234867	0401	-	3033.0000.1313.0000	17329
Phone	RM-892	004402472234875004402472234875	0401	-	3035.0000.1315.1000	17376
Headset	RM-892	2332271	WH-208	-	-	17375
Phone	RM-892	004402472236870	0401	-	3035.0000.1315.1000	17345
Battery	BL-4YW (LG)	-	4.0	-	-	17353
AC-Charger	AC-50E	409049250469060094360675619	-	-	-	17354
Headset	WH-208	2332271	-	-	-	17355

1.2. Summary of Test Results

WLAN:

Section in CFR 47	Section in RSS-GEN or RSS-210	Name of the test	Result
15.247(b)(1)	A8(0.4(4))	Conducted peak output power	PASSED
15.247(d), 15.205(b)	A8(0.5)	Band edge compliance of RF emissions	PASSED
15.247(d)	A8(0.5)	Spurious RF conducted emissions	PASSED
15.247(d), 15.209	A8(0.5)	Spurious radiated emissions	PASSED
15.207	7.2.2	AC powerline conducted emissions	PASSED
15.247(a)(2)	A8(0.1(1))	6dB(bandwidth)	PASSED
15.247(e)	A8(0.1(2))	Power spectral density	PASSED

PASSED

The EUT complies with the essential requirements in the standard.

FAILED

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

NP

The test was not performed by the TCC Nokia Laboratory.

The test results of PYARM-892 are re-used for certification of the PYARM-893. The table above indicates the results, which will be re-used.

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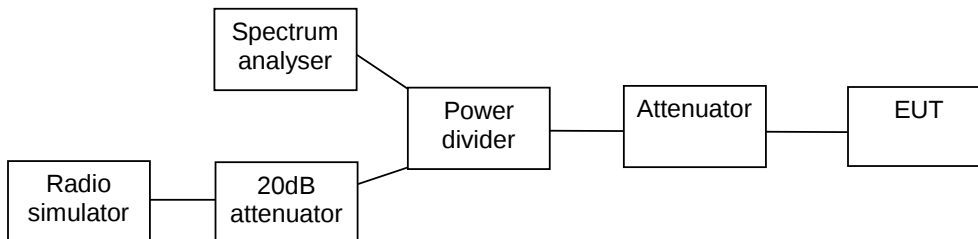
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2. Conducted peak output power (15.247(b)(1), RSS-210 A8.4 (4))

EUT with DUT number	RM-892, DUT 17329
Accessories with DUT numbers	WH-208, DUT 17375
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 33 / 100.5
Date of measurements	19-Apr-2013
Measured by	Jari Keto

2.1. Test Setup



2.2. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-210.

Limits for conducted peak output power measurements

Frequency range [MHz]	Limit [W]	Limit [dBm]
2400 – 2483.5 5725 - 5850	≤ 1	≤ 30

2.3. Power results summary

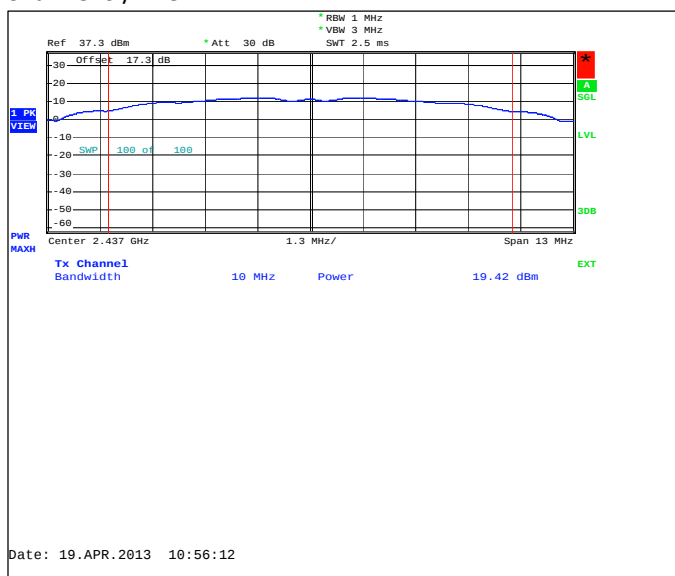
Channel / f _c [MHz]	Mode	Modulation	Data rate	Level [dBm]
6 / 2437	802.11b	BPSK	1 Mbps	19.42
6 / 2437	802.11b	QPSK	2 Mbps	19.25
6 / 2437	802.11b	QPSK	5.5 Mbps	21.14
6 / 2437	802.11b	QPSK	11 Mbps	22.2
6 / 2437	802.11g	BPSK	6 Mbps	24.23
6 / 2437	802.11g	BPSK	9 Mbps	23.78
6 / 2437	802.11g	QPSK	12 Mbps	23.47
6 / 2437	802.11g	QPSK	18 Mbps	23.48
6 / 2437	802.11g	16QAM	24 Mbps	22.89
6 / 2437	802.11g	16QAM	36 Mbps	22.89
6 / 2437	802.11g	64QAM	48 Mbps	21.97
6 / 2437	802.11g	64QAM	54 Mbps	20.87
6 / 2437	802.11n	BPSK	6.5 / 7.25 Mbps	23.29
6 / 2437	802.11n	QPSK	13.0 / 14.4 Mbps	22.61
6 / 2437	802.11n	QPSK	19.5 / 21.7 Mbps	22.53
6 / 2437	802.11n	16QAM	26.0 / 28.9 Mbps	22.12
6 / 2437	802.11n	16QAM	39.0 / 43.3 Mbps	22
6 / 2437	802.11n	64QAM	52.0 / 57.8 Mbps	20.88
6 / 2437	802.11n	64QAM	58.5 / 65.0 Mbps	20.9
6 / 2437	802.11n	64QAM	65.0 / 72.2 Mbps	19.96
1 / 2412	802.11g	BPSK	6 Mbps	18.46
11 / 2462	802.11g	BPSK	6 Mbps	18.27
1 / 2412	802.11g	QPSK	18 Mbps	15.65
11 / 2462	802.11g	QPSK	18 Mbps	17.89
11 / 2462	802.11g	BPSK	6 Mbps	18.67
149 / 5745	802.11g	BPSK	6 Mbps	23.2
157 / 5785	802.11g	BPSK	6 Mbps	23.37
165 / 5825	802.11g	BPSK	6 Mbps	23.17
149 / 5745	802.11n	QPSK	19.5 / 21.7 Mbps	22.91
157 / 5785	802.11n	QPSK	19.5 / 21.7 Mbps	23.13
165 / 5825	802.11n	QPSK	19.5 / 21.7 Mbps	22.94
149+153 / 5755	802.11n	BPSK	13.5 / 15.0 Mbps	21.53
157+161 / 5795	802.11n	BPSK	13.5 / 15.0 Mbps	21.74
149+153 / 5755	802.11n	16QAM	81.0 / 90.0 Mbps	21.06
157+161 / 5795	802.11n	16QAM	81.0 / 90.0 Mbps	21.34

2.4. WLAN Test results

2.4.1 802.11b mode, BPSK modulation, 1 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	19.42	87.498	PASSED

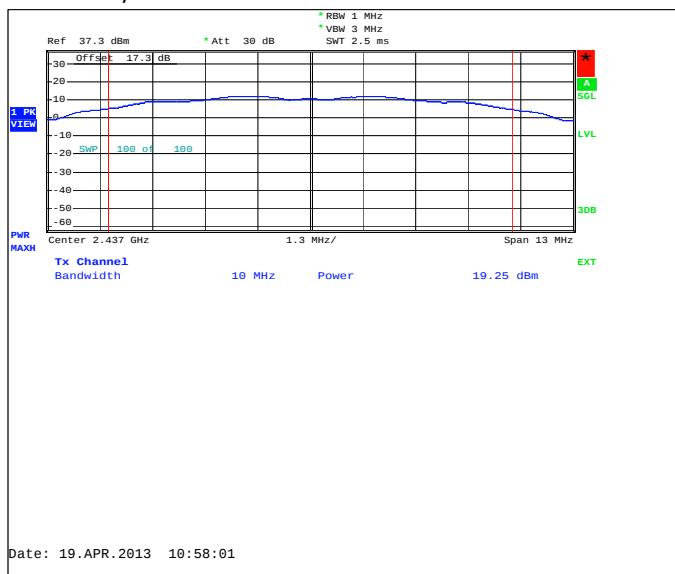
Channel 6 / 2437 MHz



2.4.2 802.11b mode, QPSK modulation, 2 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	19.25	84.14	PASSED

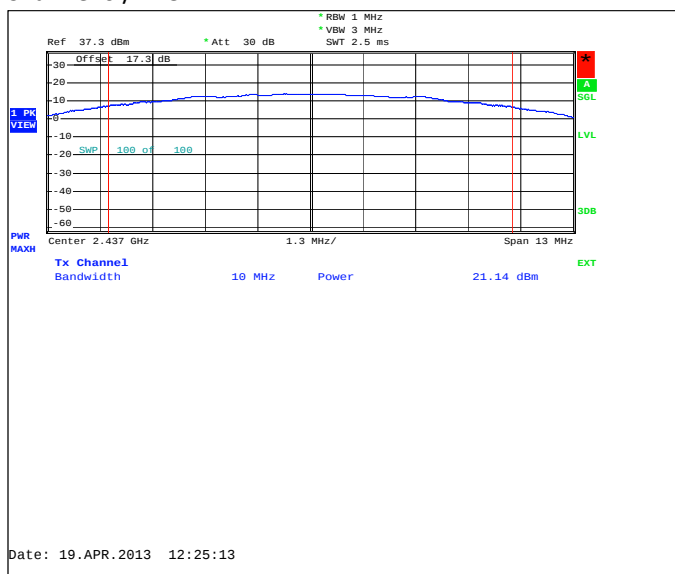
Channel 6 / 2437 MHz



2.4.3 802.11b mode, QPSK modulation, 5.5 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	21.14	130.017	PASSED

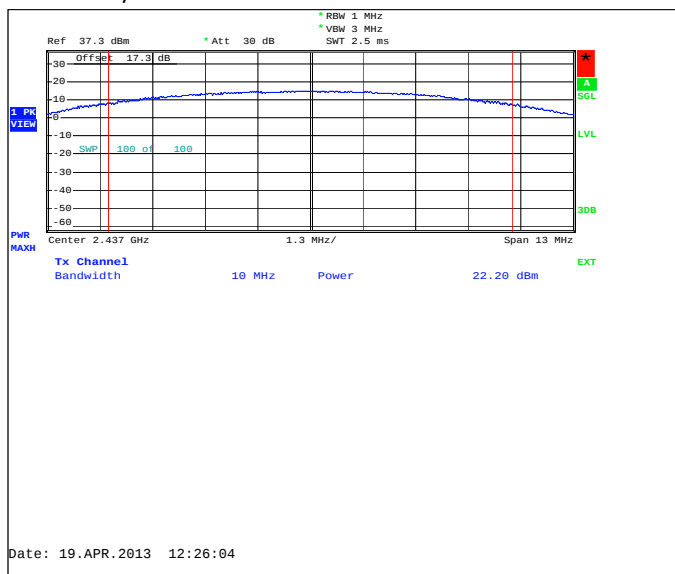
Channel 6 / 2437 MHz



2.4.4 802.11b mode, QPSK modulation, 11 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	22.2	165.959	PASSED

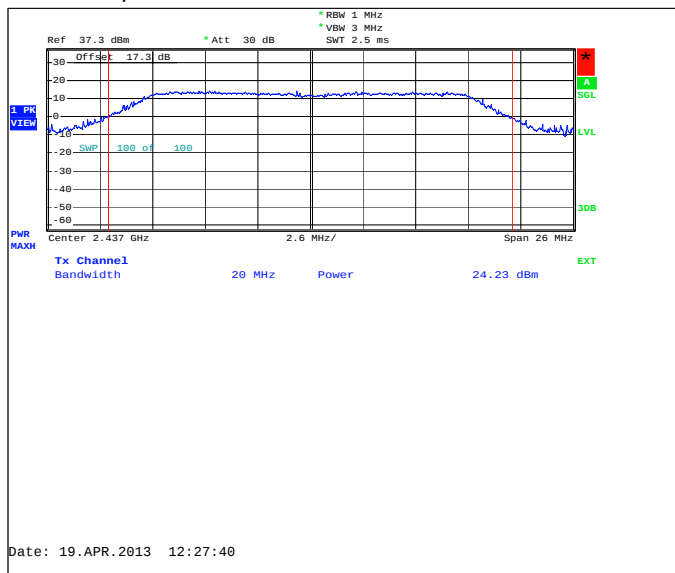
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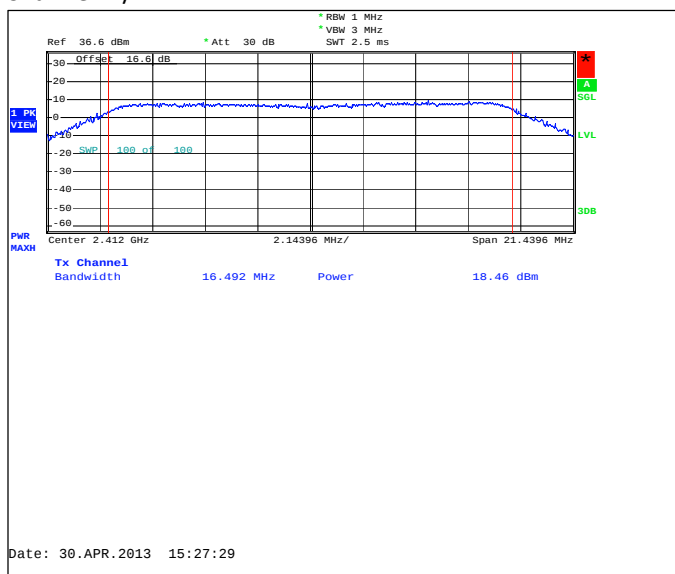
2.4.5 802.11g mode, BPSK modulation, 6 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	24.23	264.85	PASSED
1 / 2412	18.46	70.146	PASSED
11 / 2462	18.27	67.143	PASSED

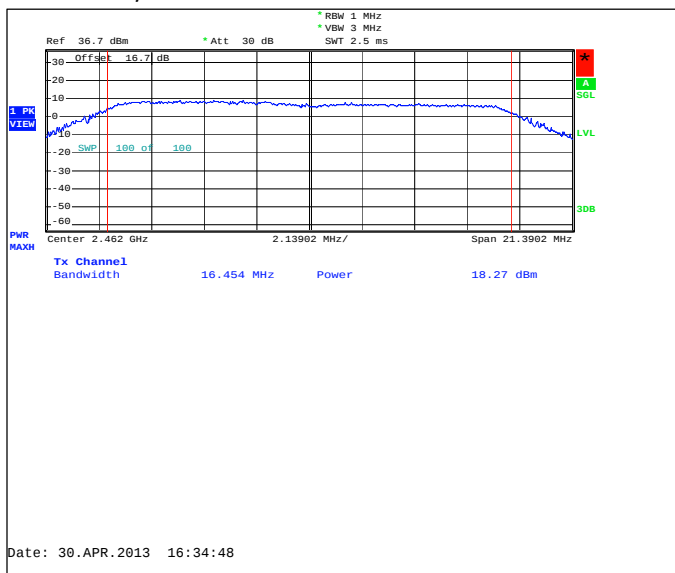
Channel 6 / 2437 MHz



Channel 1 / 2412 MHz



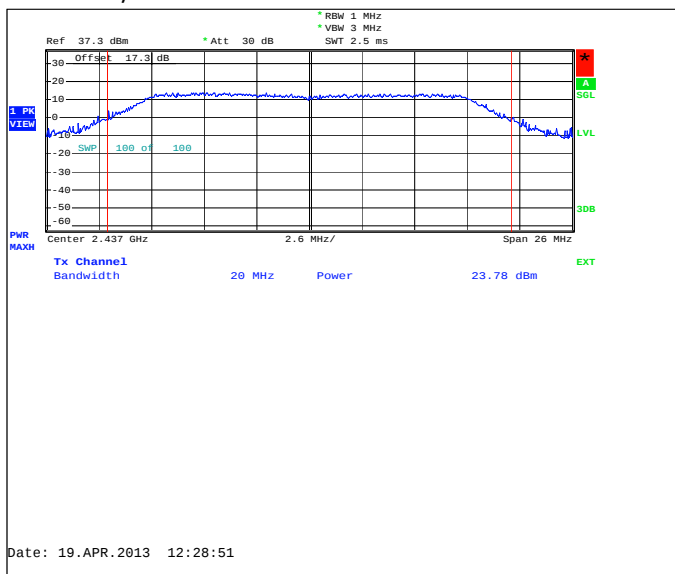
Channel 11 / 2462 MHz



2.4.6 802.11g mode, BPSK modulation, 9 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	23.78	238.781	PASSED

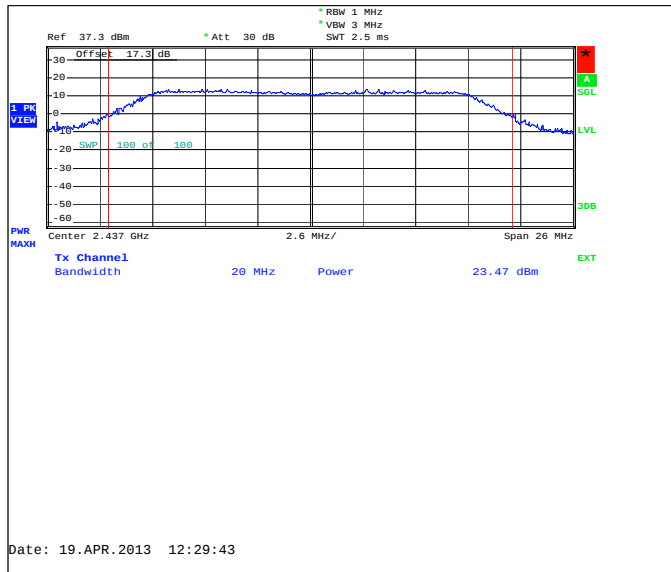
Channel 6 / 2437 MHz



2.4.7 802.11g mode, QPSK modulation, 12 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	23.47	222.331	PASSED

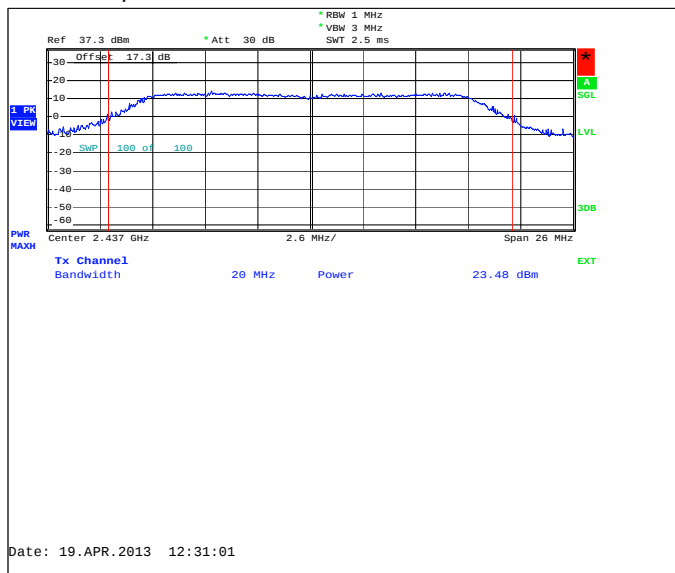
Channel 6 / 2437 MHz



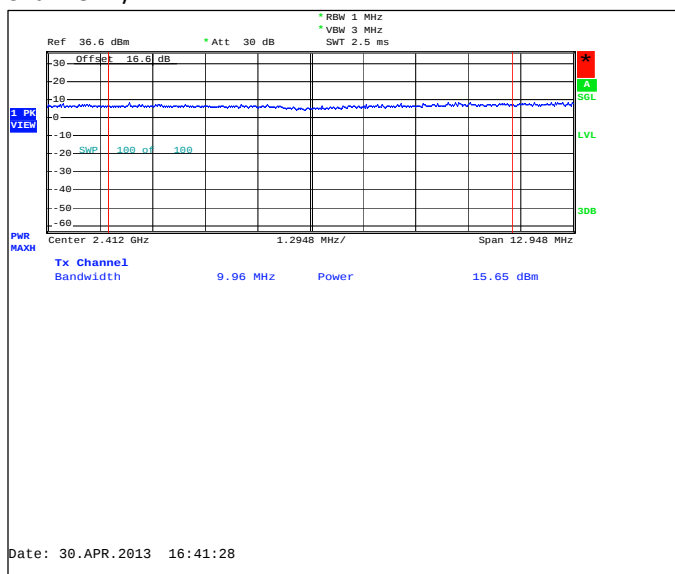
2.4.8 802.11g mode, QPSK modulation, 18 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	23.48	222.844	PASSED
1 / 2412	15.65	36.728	PASSED
11 / 2462	17.89	61.518	PASSED

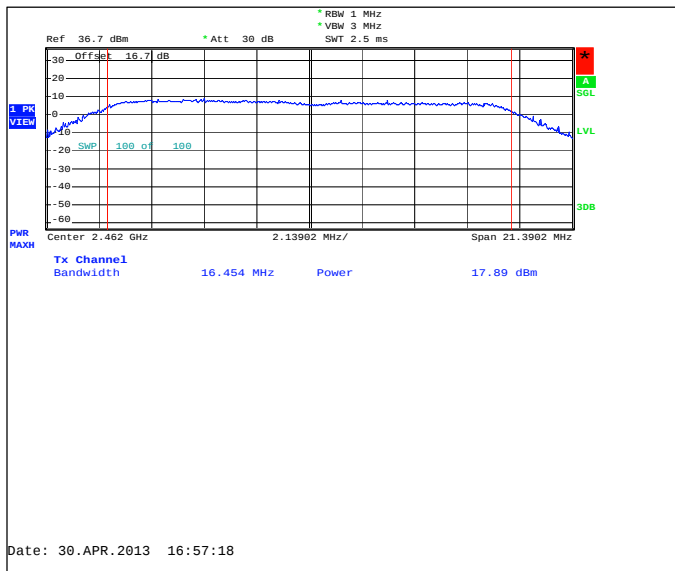
Channel 6 / 2437 MHz



Channel 1 / 2412 MHz



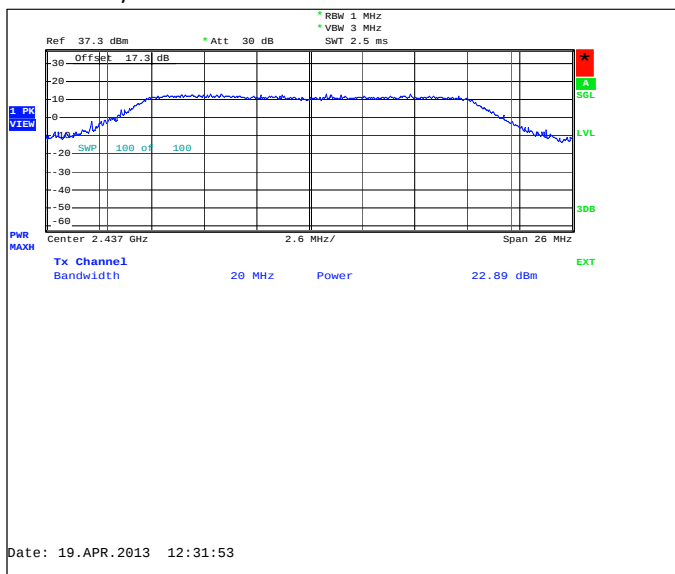
Channel 11 / 2462 MHz



2.4.9 802.11g mode, 16QAM modulation, 24 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	22.89	194.536	PASSED

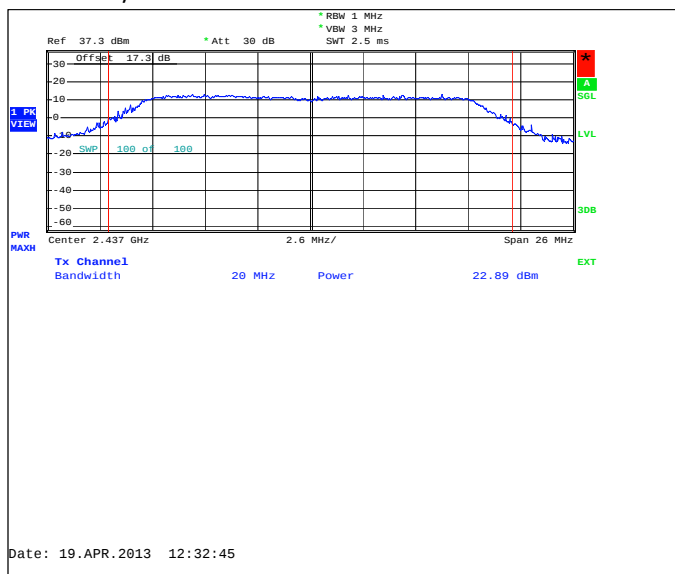
Channel 6 / 2437 MHz



2.4.10 802.11g mode, 16QAM modulation, 36 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	22.89	194.536	PASSED

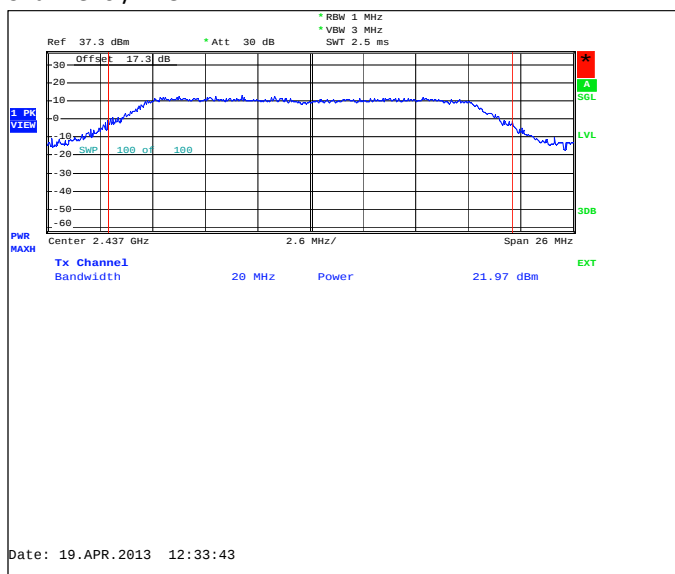
Channel 6 / 2437 MHz



2.4.11 802.11g mode, 64QAM modulation, 48 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	21.97	157.398	PASSED

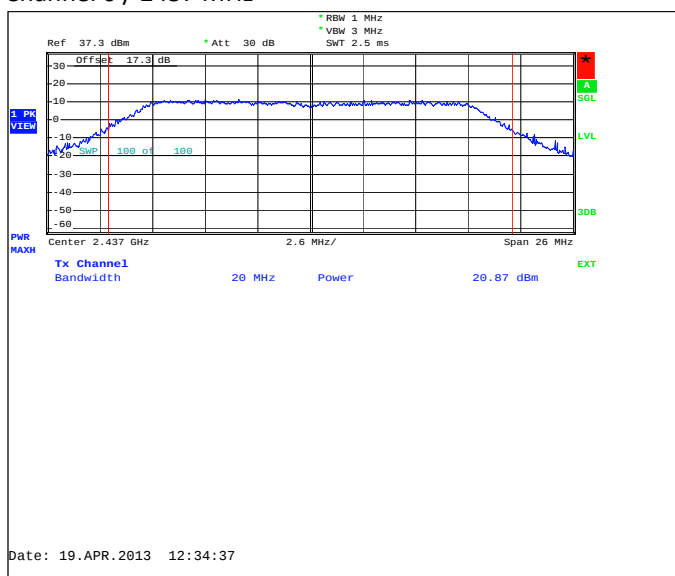
Channel 6 / 2437 MHz



2.4.12 802.11g mode, 64QAM modulation, 54 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	20.87	122.18	PASSED

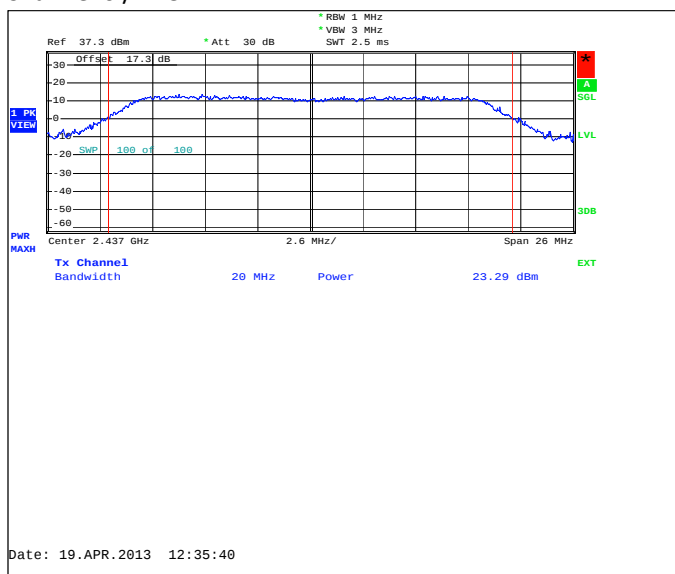
Channel 6 / 2437 MHz



2.4.13 802.11n mode, BPSK modulation, 6.5 / 7.25 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	23.29	213.304	PASSED

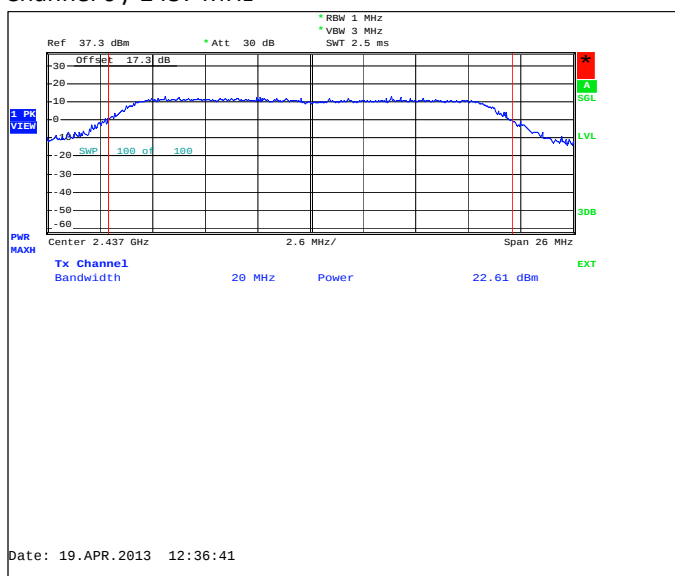
Channel 6 / 2437 MHz



2.4.14 802.11n mode, QPSK modulation, 13.0 / 14.4 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	22.61	182.39	PASSED

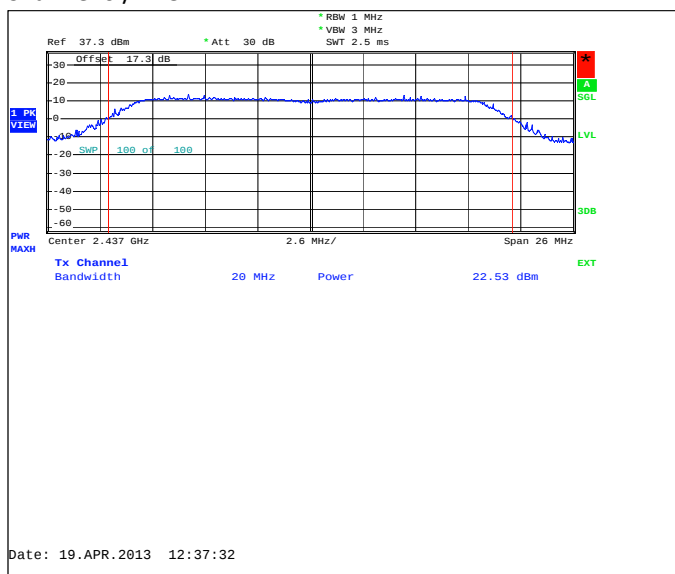
Channel 6 / 2437 MHz



2.4.15 802.11n mode, QPSK modulation, 19.5 / 21.7 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	22.53	179.061	PASSED

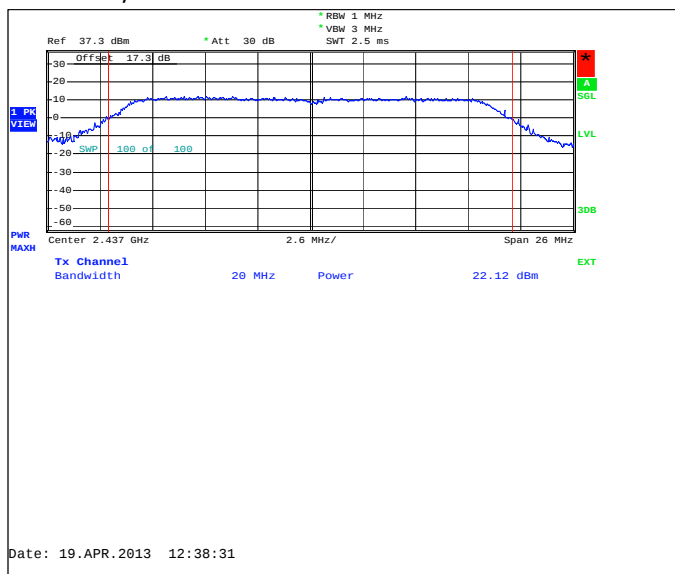
Channel 6 / 2437 MHz



2.4.16 802.11n mode, 16QAM modulation, 26.0 / 28.9 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	22.12	162.93	PASSED

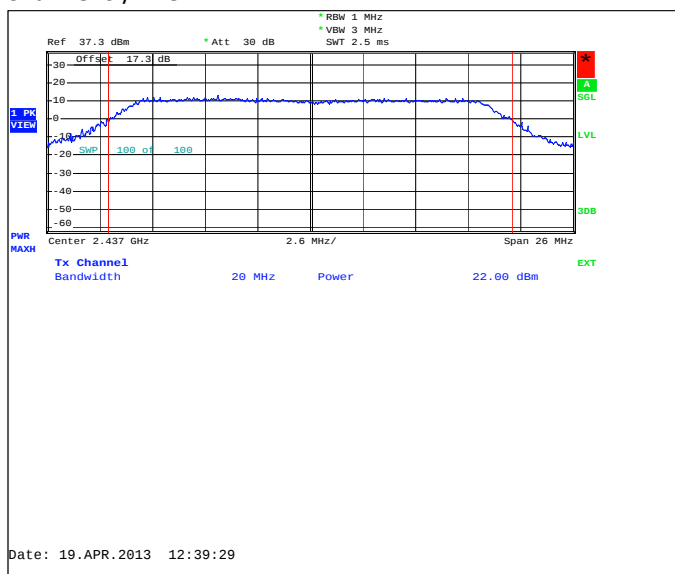
Channel 6 / 2437 MHz



2.4.17 802.11n mode, 16QAM modulation, 39.0 / 43.3 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	22	158.489	PASSED

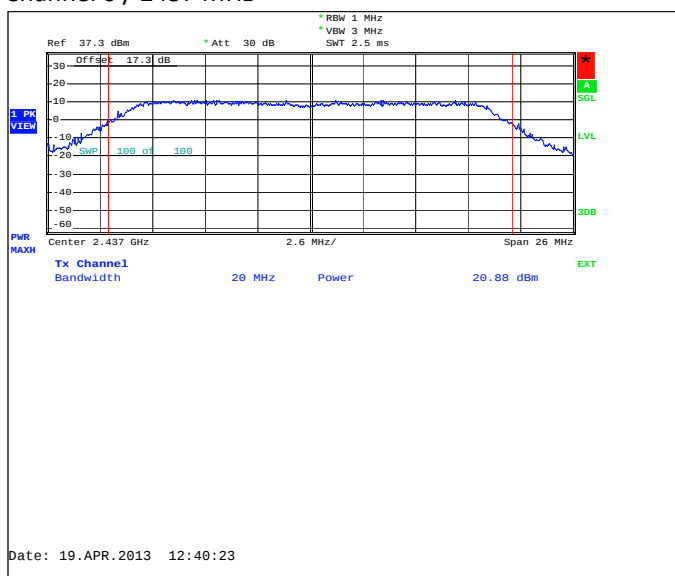
Channel 6 / 2437 MHz



2.4.18 802.11n mode, 64QAM modulation, 52.0 / 57.8 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	20.88	122.462	PASSED

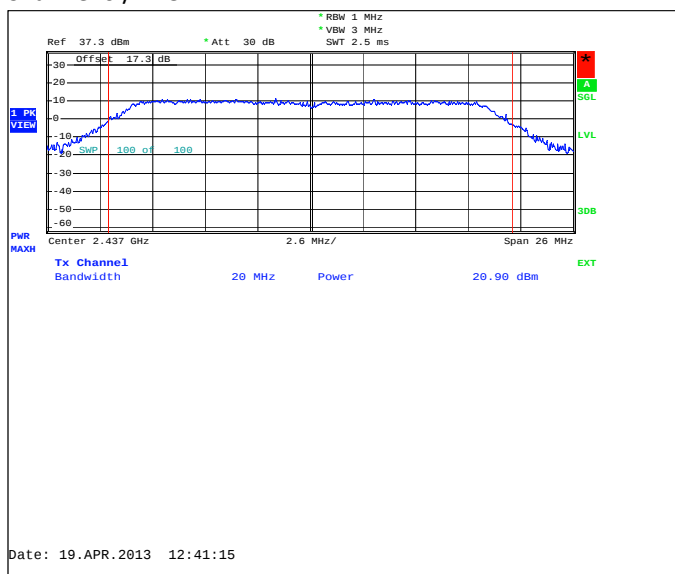
Channel 6 / 2437 MHz



2.4.19 802.11n mode, 64QAM modulation, 58.5 / 65.0 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	20.9	123.027	PASSED

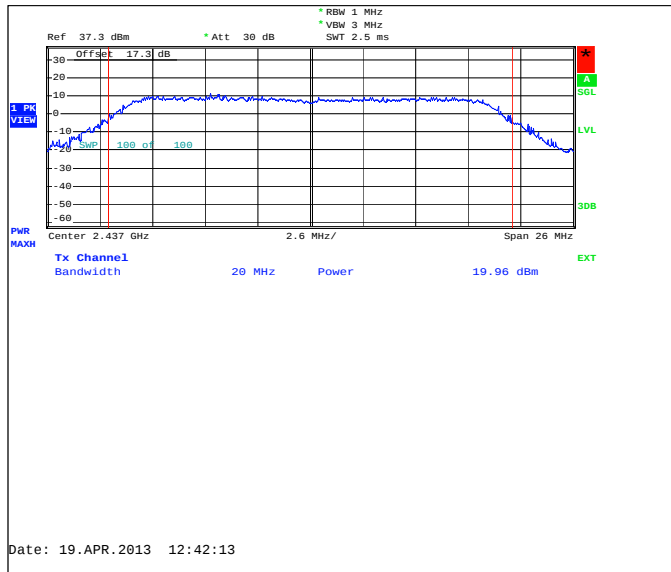
Channel 6 / 2437 MHz



2.4.20 802.11n mode, 64QAM modulation, 65.0 / 72.2 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
6 / 2437	19.96	99.083	PASSED

Channel 6 / 2437 MHz

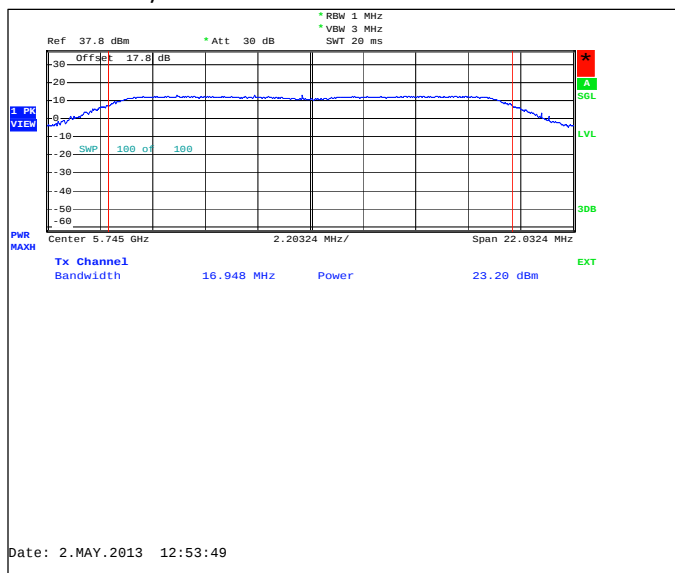


2.5. 5 GHz RLAN Test results

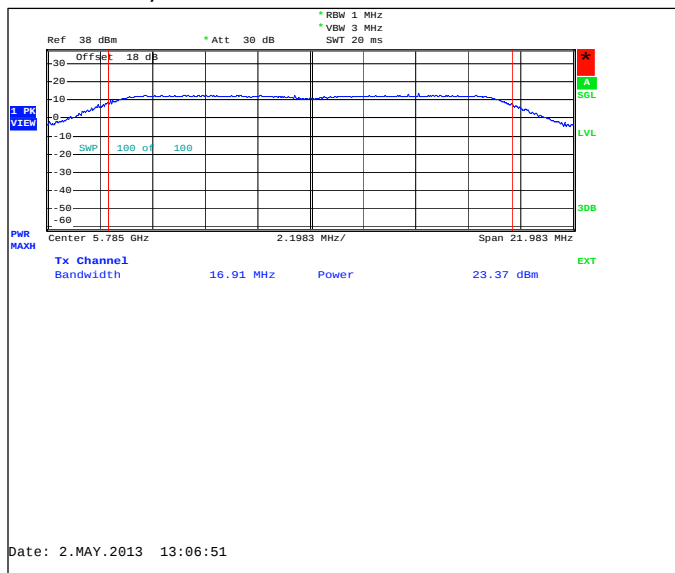
2.5.1 802.11g mode, BPSK modulation, 6 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
149 / 5745	23.2	208.93	PASSED
157 / 5785	23.37	217.27	PASSED
165 / 5825	23.17	207.491	PASSED

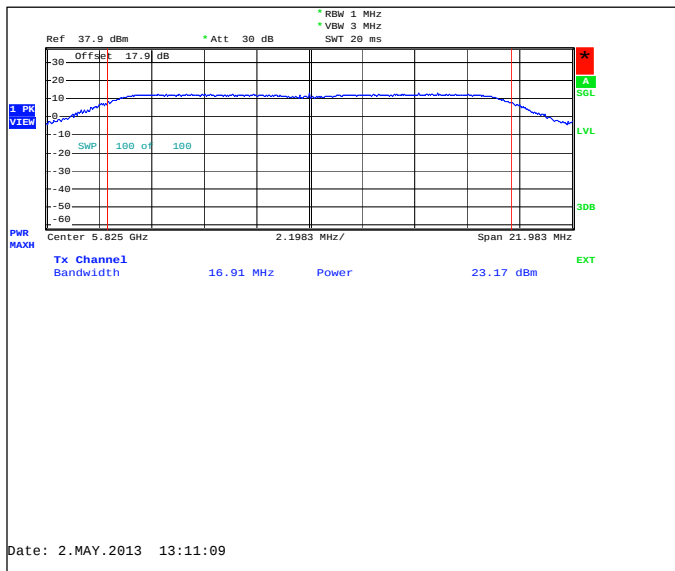
Channel 149 / 5745MHz



Channel 157 / 5785MHz



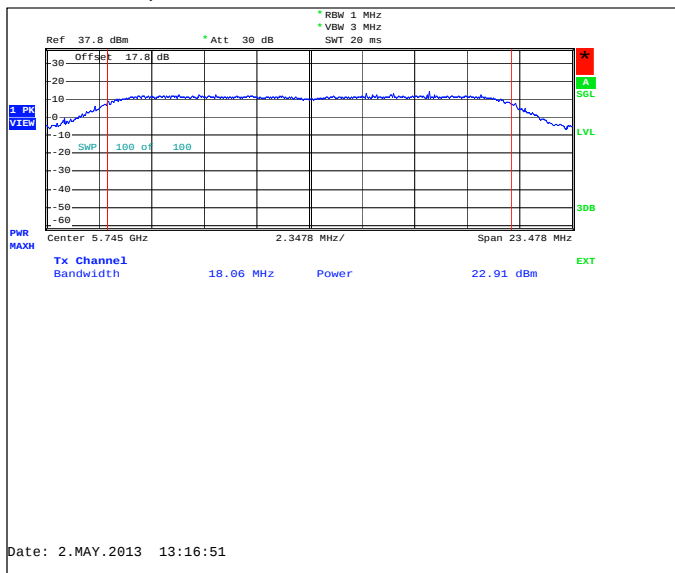
Channel 165 / 5825MHz



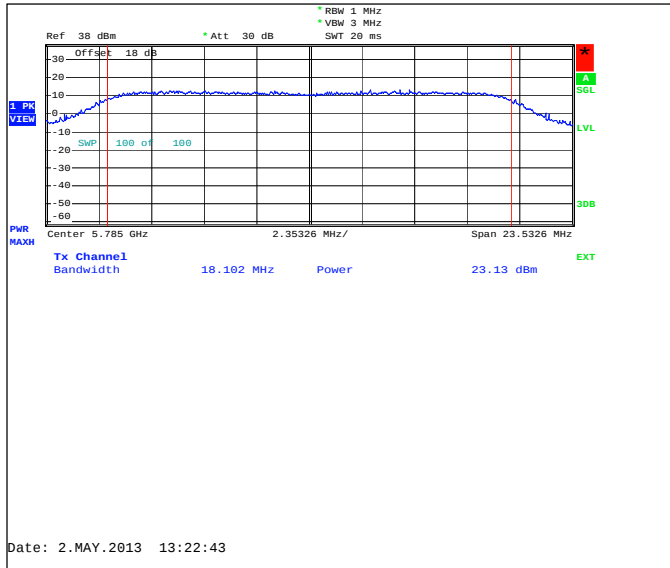
2.5.2 802.11n mode, QPSK modulation, 19.5 / 21.7 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
149 / 5745	22.91	195.434	PASSED
157 / 5785	23.13	205.589	PASSED
165 / 5825	22.94	196.789	PASSED

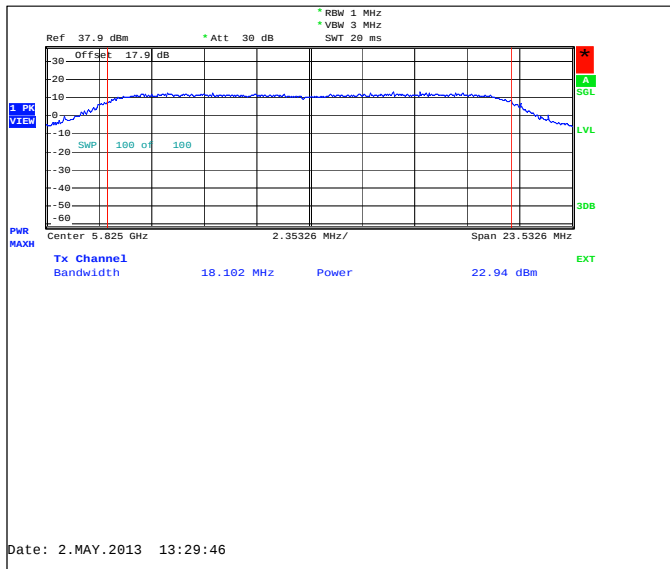
Channel 149 / 5745MHz



Channel 157 / 5785MHz



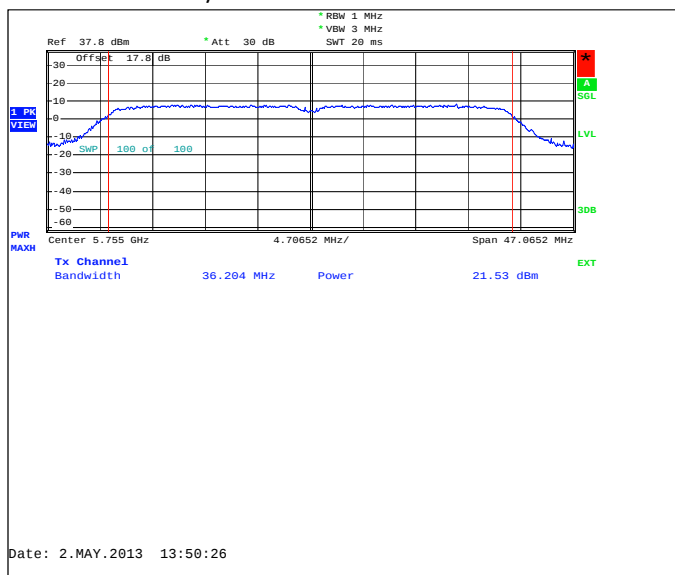
Channel 165 / 5825MHz



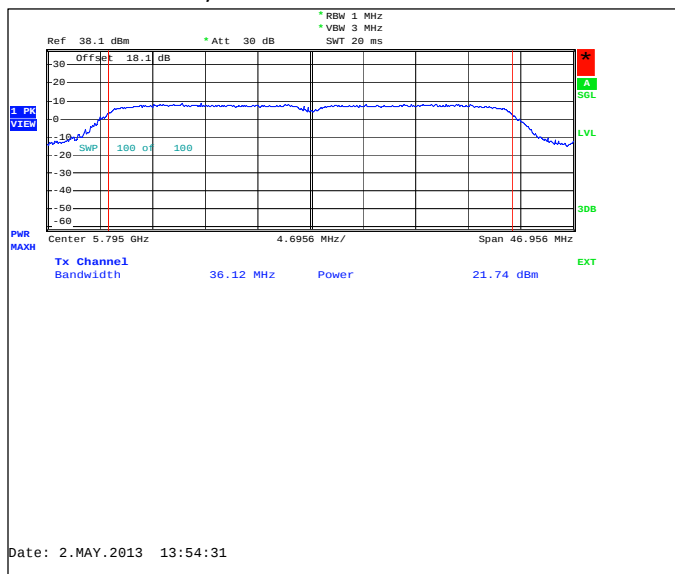
2.5.3 802.11n mode, BPSK modulation, 13.5 / 15.0 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
149+153 / 5755	21.53	142.233	PASSED
157+161 / 5795	21.74	149.279	PASSED

Channel 149+153 / 5755MHz



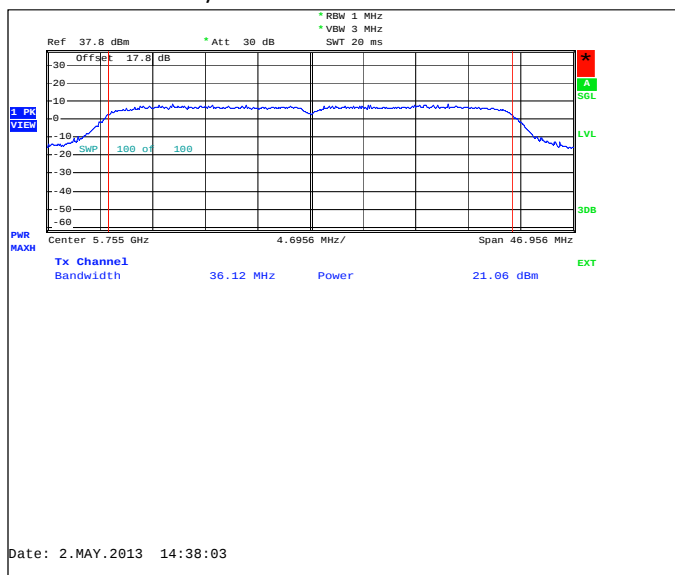
Channel 157+161 / 5795MHz



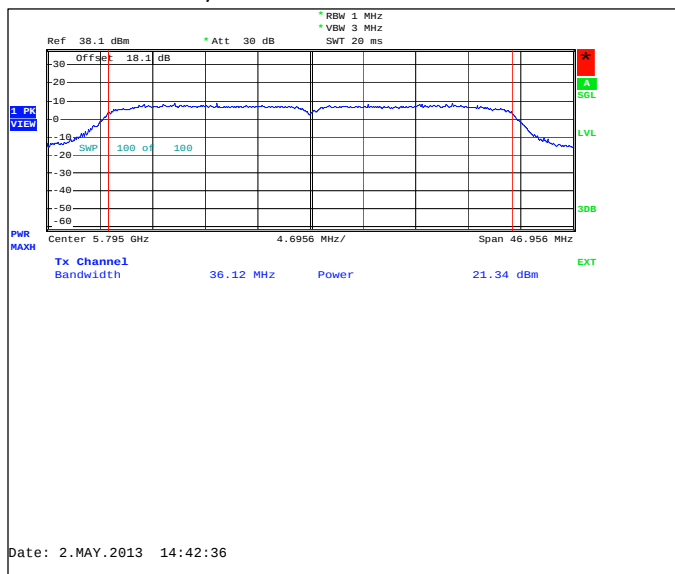
2.5.4 802.11n mode, 16QAM modulation, 81.0 / 90.0 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
149+153 / 5755	21.06	127.644	PASSED
157+161 / 5795	21.34	136.144	PASSED

Channel 149+153 / 5755MHz



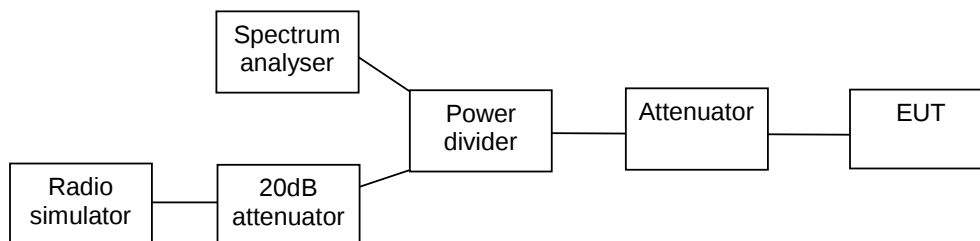
Channel 157+161 / 5795MHz



3. Spurious RF conducted emissions (FCC §15.247(d), RSS-210 A8.5)

EUT with DUT number	RM-892, DUT 17376
Accessories with DUT numbers	WH-208, DUT 17375
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 33 / 100.5
Date of measurements	30-Apr-2013
Measured by	Jari Keto

3.1. Test Setup



3.2. Test method and limit

The measurement is made according to Public notice KDB 558 074 and IC standard RSS-210.

The reference level for the -20 dBc measurement was obtained as instructed in section 5.4.1.1 of the KDB 558074, using 5-30 % wider span than the EBW.

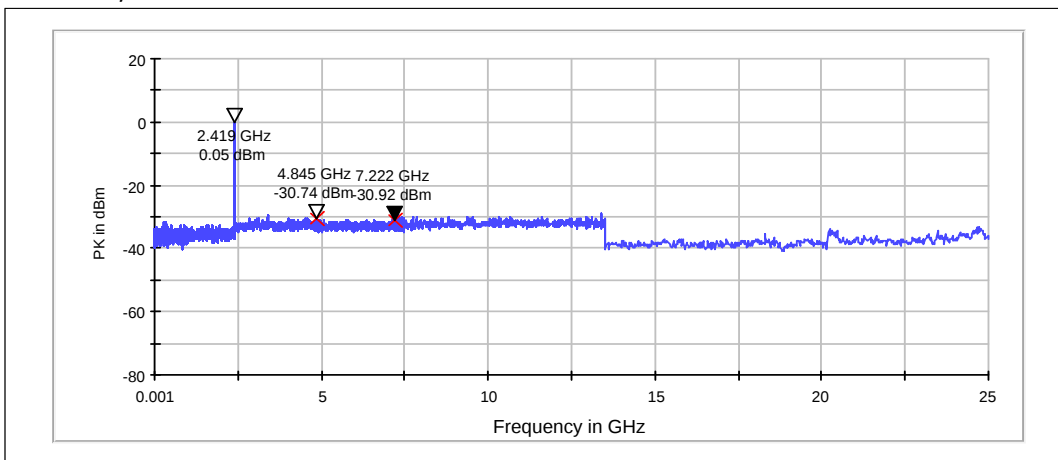
Limits for spurious RF conducted emissions measurements

Frequency range [MHz]	Limit [dBc]
1 – 25000	<= -20

3.3. WLAN Test results

3.3.1 802.11g mode, BPSK modulation, 6 Mbps data rate

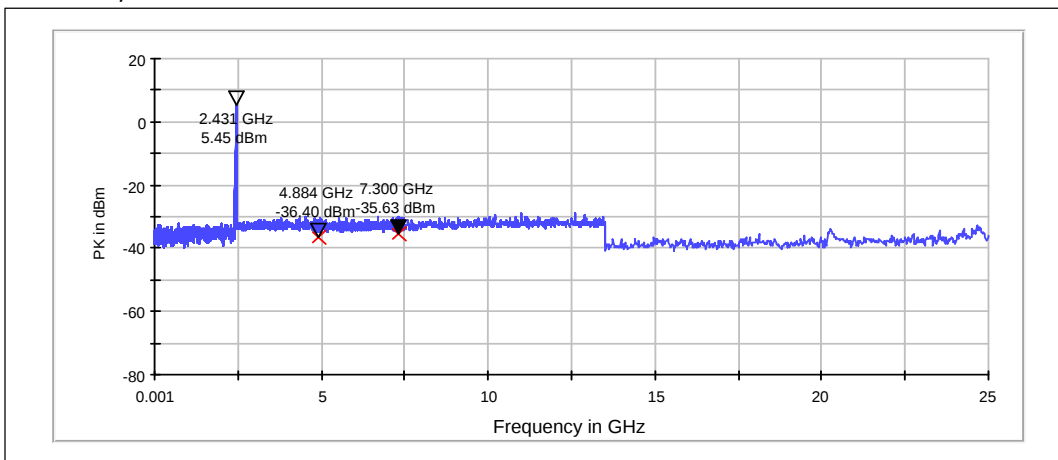
Channel 1 / 2412 MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
4844.800	-30.74	PASSED
7222.200	-30.92	PASSED

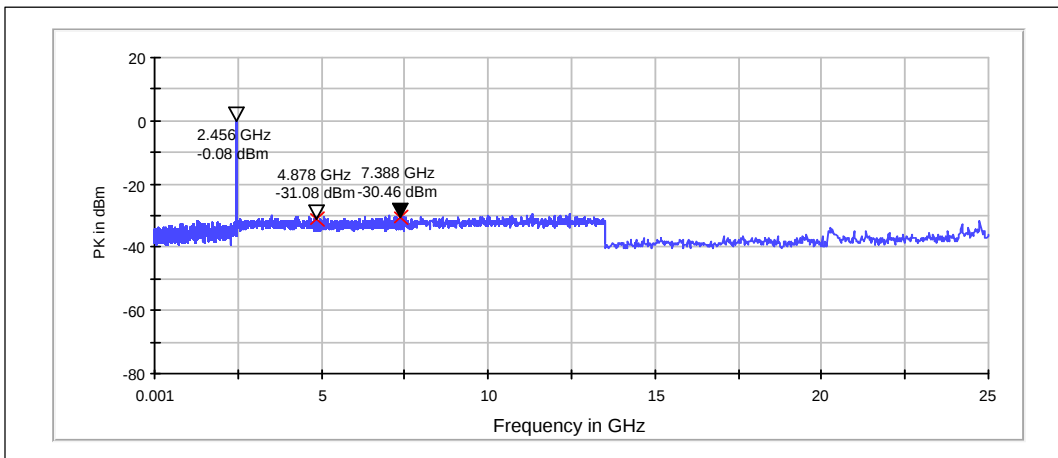
Channel 6 / 2437 MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
4884.400	-36.40	PASSED
7300.200	-35.63	PASSED

Channel 11 / 2462 MHz

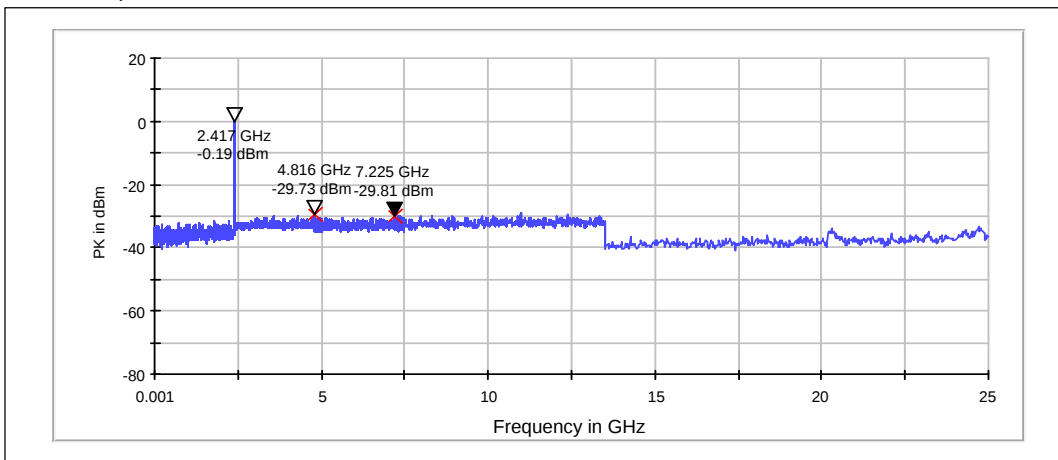


Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
4878.000	-31.08	PASSED
7387.800	-30.46	PASSED

3.3.2 802.11g mode, QPSK modulation, 18 Mbps data rate

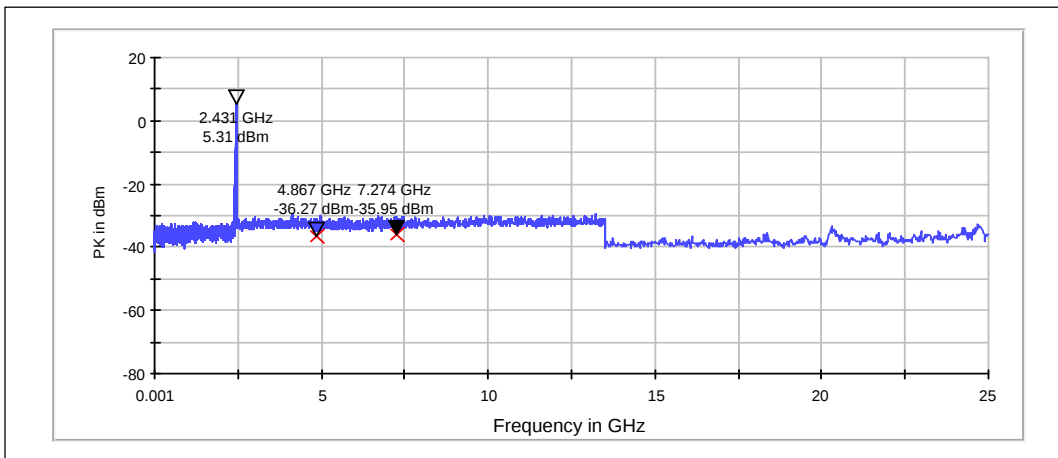
Channel 1 / 2412 MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
4816.000	-29.73	PASSED
7225.200	-29.81	PASSED

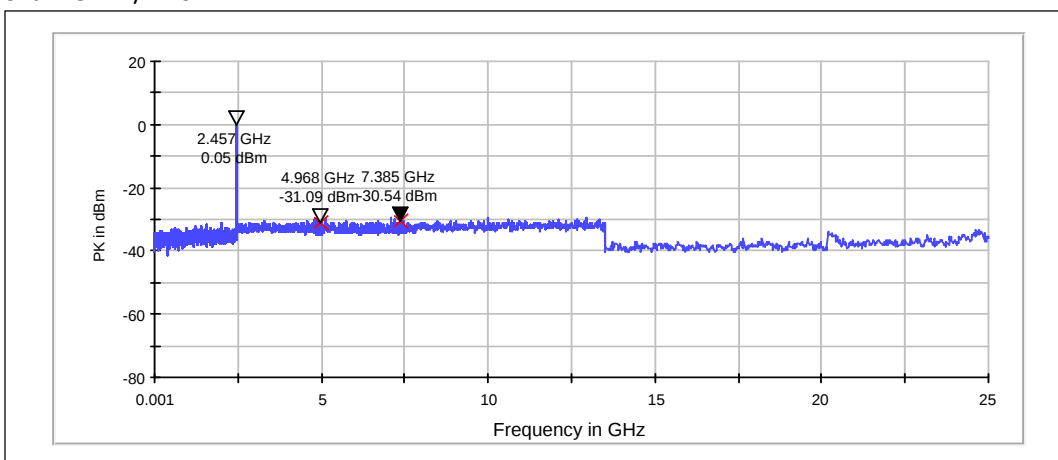
Channel 6 / 2437 MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
4867.200	-36.27	PASSED
7274.400	-35.95	PASSED

Channel 11 / 2462 MHz



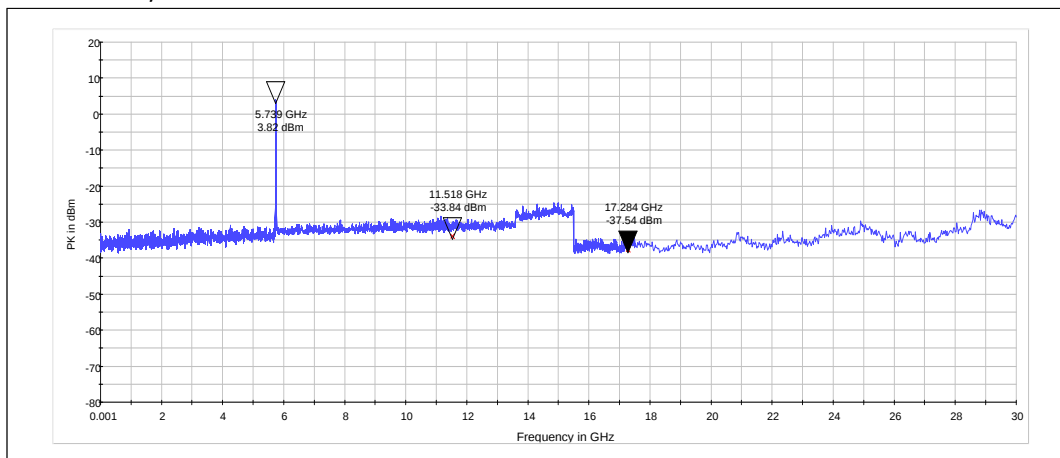
Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
4968.000	-31.09	PASSED
7385.400	-30.54	PASSED

3.4. 5 GHz RLAN Test results

3.4.1 802.11g mode, BPSK modulation, 6 Mbps data rate

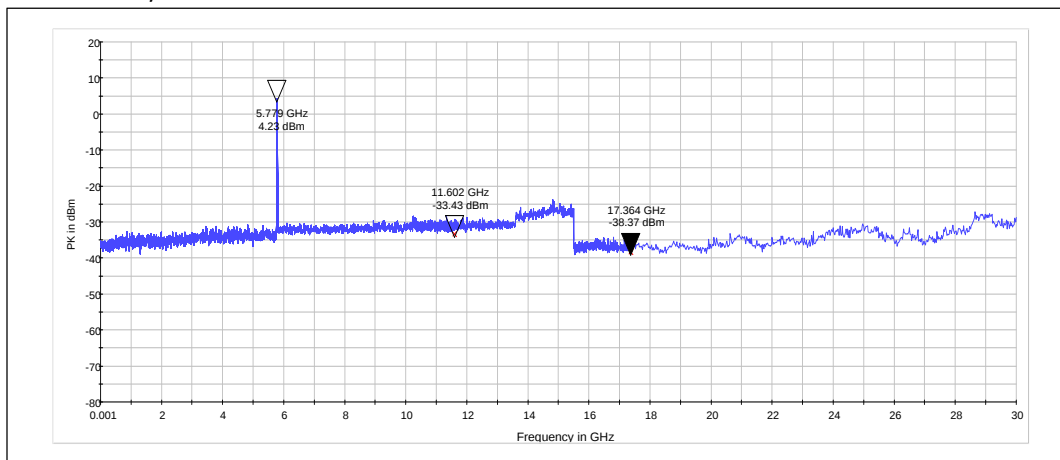
Channel 149 / 5745MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
11518.000	-33.84	PASSED
17284.000	-37.54	PASSED

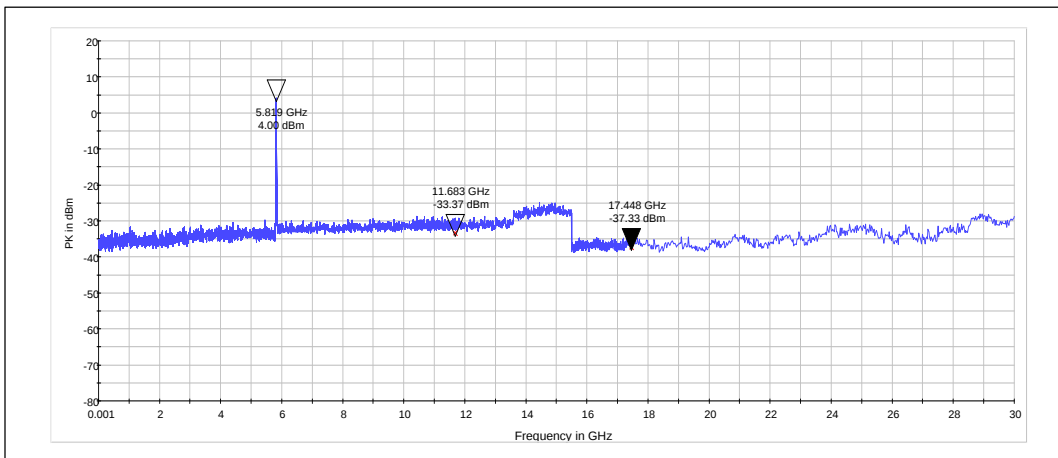
Channel 157 / 5785MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
11602.000	-33.43	PASSED
17364.000	-38.37	PASSED

Channel 165 / 5825MHz

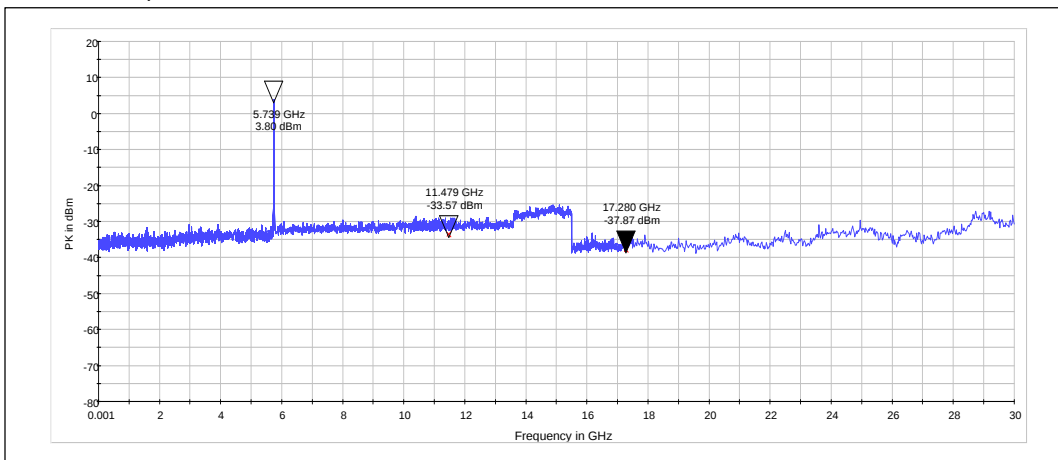


Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
11683.200	-33.37	PASSED
17448.000	-37.33	PASSED

3.4.2 802.11n mode, QPSK modulation, 19.5 / 21.7 Mbps data rate

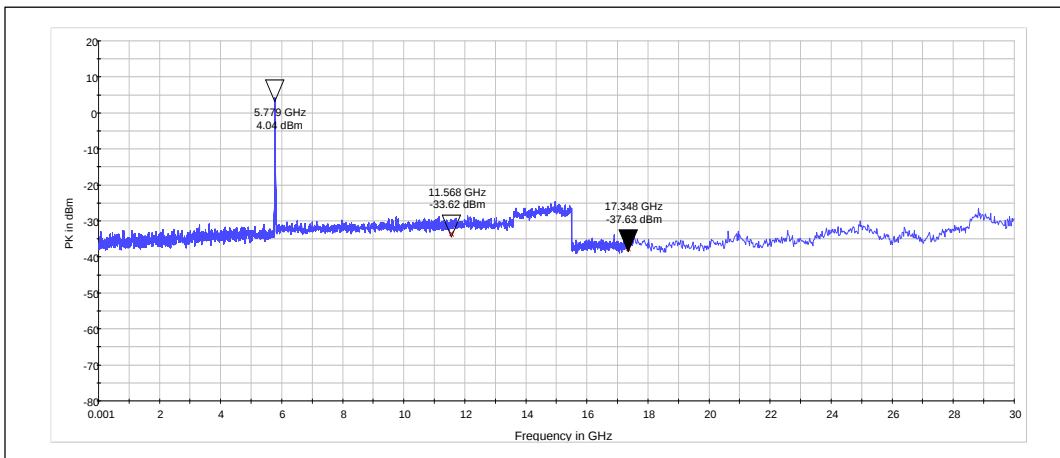
Channel 149 / 5745MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
11478.800	-33.57	PASSED
17280.000	-37.87	PASSED

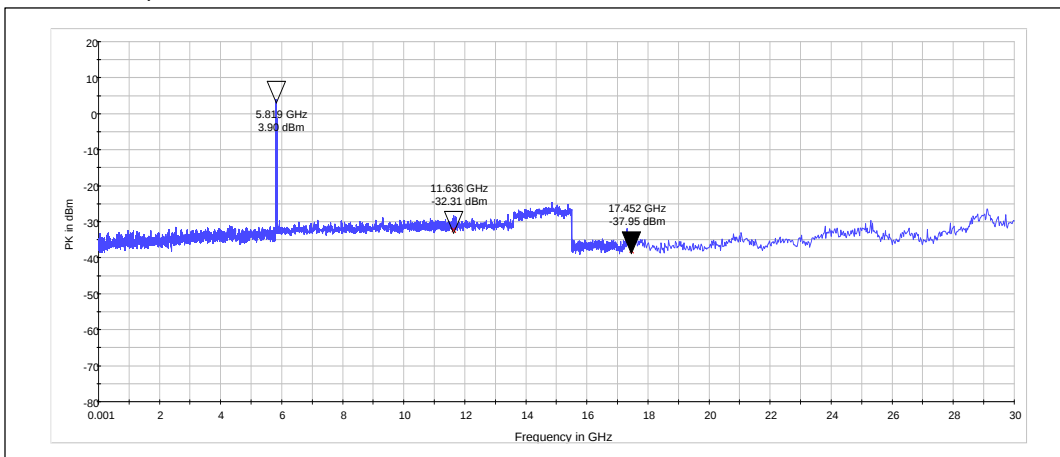
Channel 157 / 5785MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
11568.400	-33.62	PASSED
17348.000	-37.63	PASSED

Channel 165 / 5825MHz

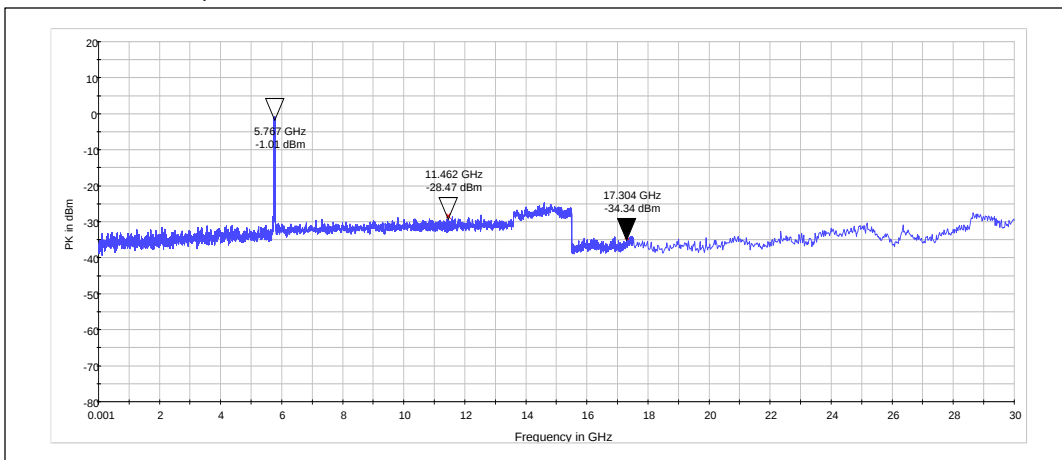


Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
11635.600	-32.31	PASSED
17452.000	-37.95	PASSED

3.4.3 802.11n mode, BPSK modulation, 13.5 / 15.0 Mbps data rate

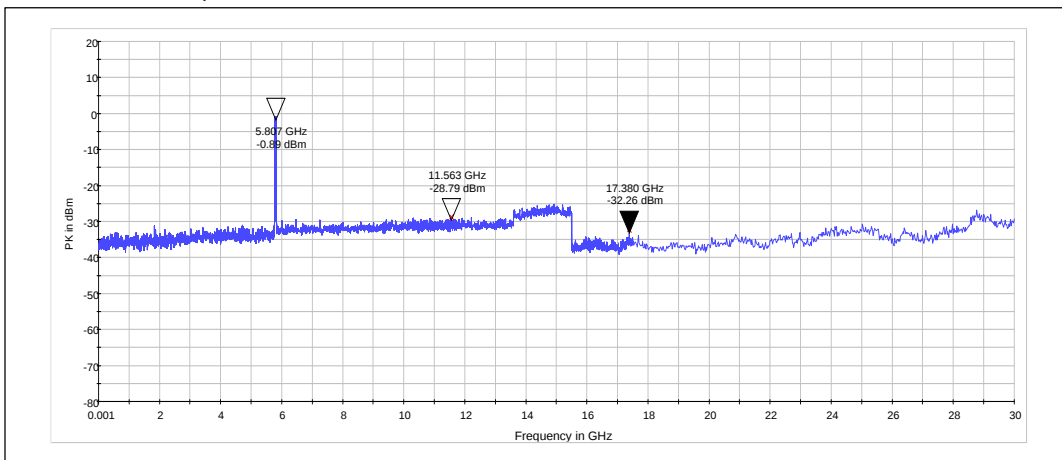
Channel 149+153 / 5755MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
11462.000	-28.47	PASSED
17304.000	-34.34	PASSED

Channel 157+161 / 5795MHz

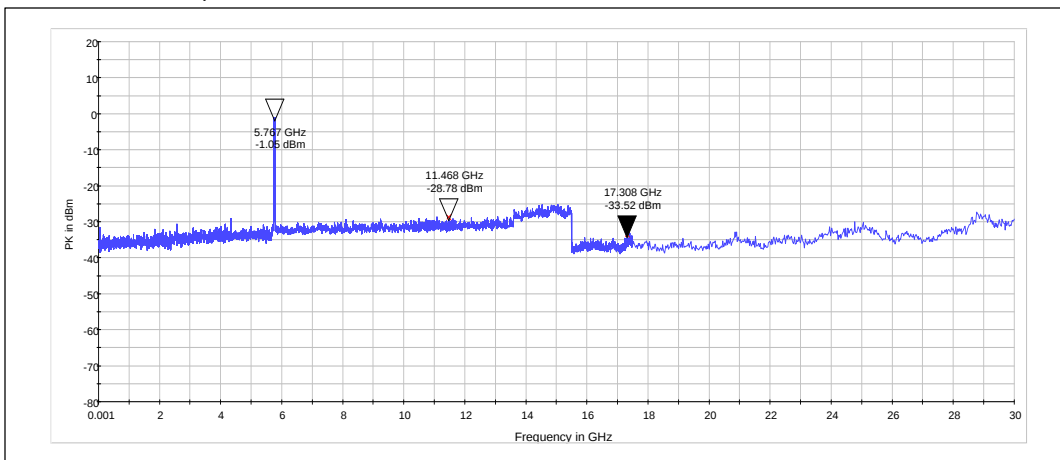


Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
11562.800	-28.79	PASSED
17380.000	-32.26	PASSED

3.4.4 802.11n mode, 16QAM modulation, 81.0 / 90.0 Mbps data rate

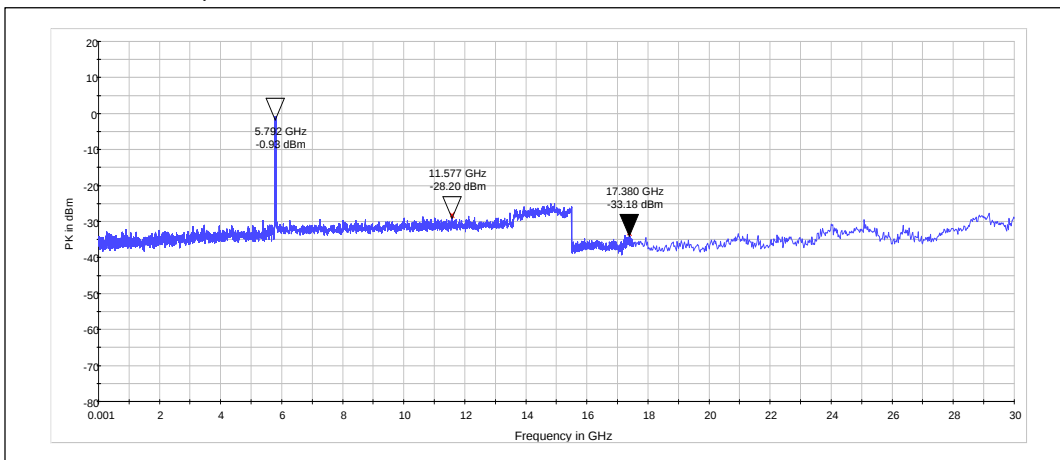
Channel 149+153 / 5755MHz



Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
11467.600	-28.78	PASSED
17308.000	-33.52	PASSED

Channel 157+161 / 5795MHz



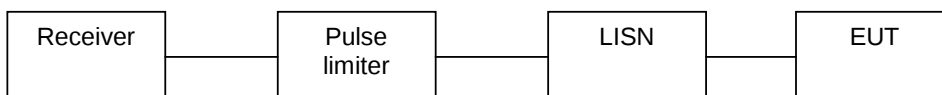
Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
11576.800	-28.20	PASSED
17380.000	-33.18	PASSED

4. AC powerline conducted emissions (FCC §15.207, RSS-GEN 7.2.2)

EUT with DUT number	RM-892, DUT 17345
Accessories with DUT numbers	BL-4YW (LG), DUT 17353 ; AC-50E, DUT 17354 ; WH-208, DUT 17355
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 34 / 102
Date of measurements	04-May-2013
Measured by	Tomi Lipponen

4.1. Test Setup



4.2. Test method and limit

The measurement is made according to procedure KDB 558074 D01 and IC standard RSS-GEN as follows:

The EUT is placed on a wooden table 80 cm above the reference groundplane.

The EUT is connected via LISN to a test power supply.

The measurement results are obtained as described below:

$$U [dB\mu V] = U_{RX} + A_{TOT}$$

Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

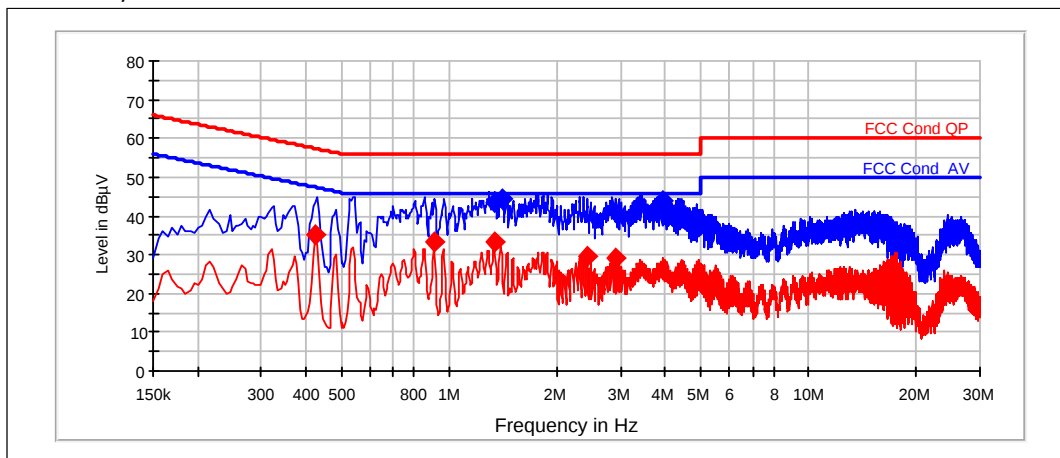
CISPR 22 Class B limits

Frequency range [MHz]	Quasi peak limit [dBμV]	Average limit [dBμV]
0.15 - 0.5	66 - 56	56 - 46
0.5 - 5	56	46
5 - 30	60	50

4.3. WLAN Test results

4.3.1 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 6 / 2437 MHz



QuasiPeak (RBW: 9 kHz)

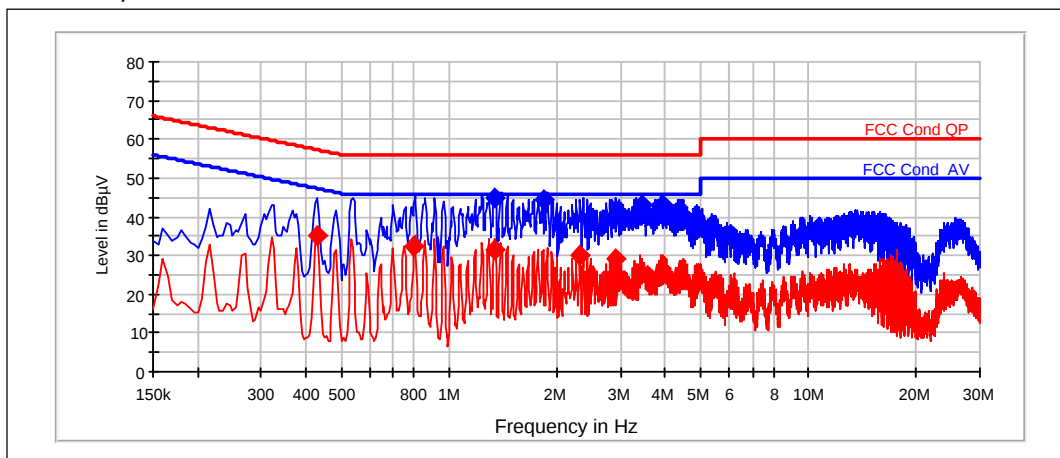
Frequency [MHz]	U [dBμV]	Line	Result
1.34	43.46	L1	PASSED
1.4	44.22	L1	PASSED
3.865	42.37	L1	PASSED
3.93	43.89	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.425	35.04	L1	PASSED
0.91	33.14	L1	PASSED
1.335	33.33	L1	PASSED
2.42	29.8	L1	PASSED
2.905	29.2	L1	PASSED

4.3.2 OFDM mode, QPSK modulation, 18 Mbps data rate

Channel 6 / 2437 MHz



QuasiPeak (RBW: 9 kHz)

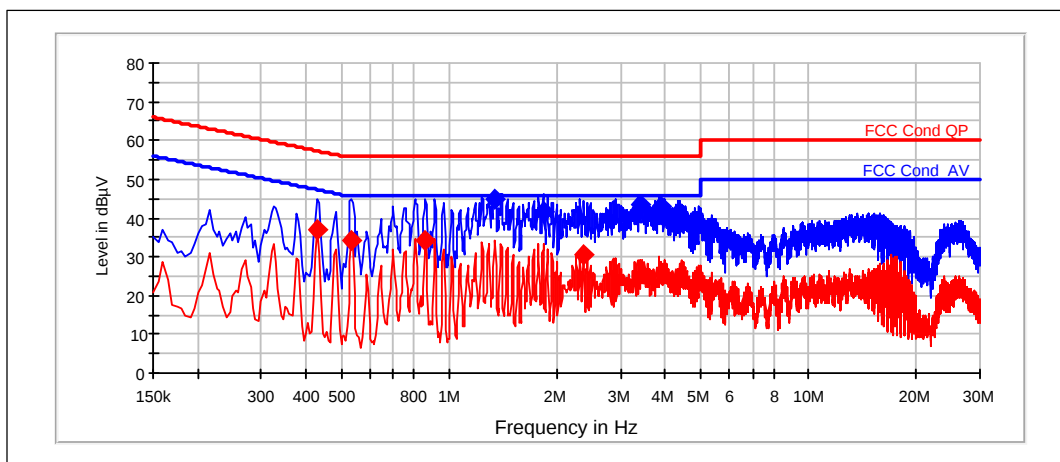
Frequency [MHz]	U [dBμV]	Line	Result
1.345	45.07	L1	PASSED
1.83	44.55	L1	PASSED
3.435	42.79	L1	PASSED
3.92	43.21	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.43	35.25	L1	PASSED
0.8	32.51	L1	PASSED
1.335	31.49	L1	PASSED
2.315	30.13	L1	PASSED
2.905	29.04	L1	PASSED

4.4. 5 GHz RLAN Test results

4.4.1 OFDM mode, BPSK modulation, 6 Mbps data rate



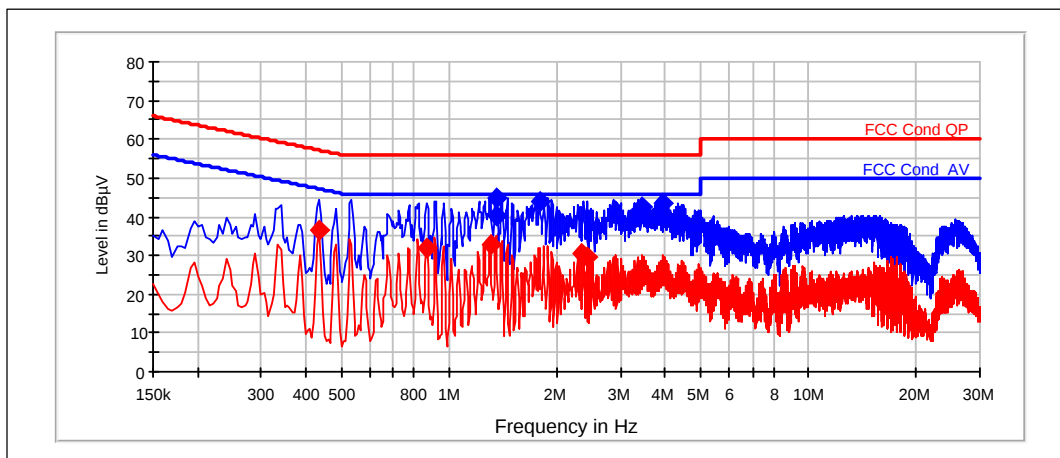
QuasiPeak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
1.345	44.82	L1	PASSED
1.825	41.42	L1	PASSED
3.385	43.49	L1	PASSED
3.87	43.05	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.43	36.86	L1	PASSED
0.535	34.03	L1	PASSED
0.86	34.13	L1	PASSED
2.37	30.59	L1	PASSED

4.4.2 n-mode, 20 MHz CBW mode, QPSK modulation, 19.5 / 21.7 Mbps data rate



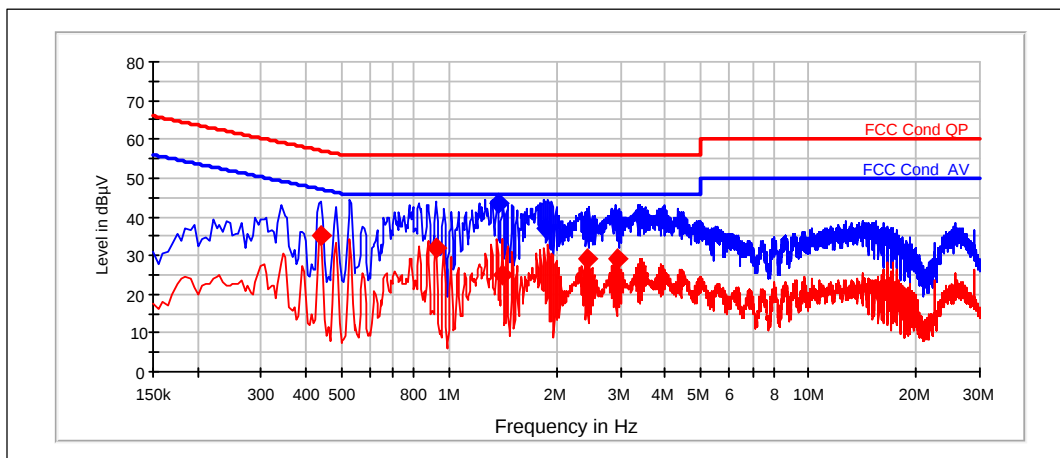
QuasiPeak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
1.35	40.43	L1	PASSED
1.355	44.78	L1	PASSED
1.79	43.99	L1	PASSED
3.435	42.53	L1	PASSED
3.92	43.36	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.435	36.46	L1	PASSED
0.87	31.93	L1	PASSED
1.3	32.91	L1	PASSED
2.325	30.32	L1	PASSED
2.42	29.72	L1	PASSED

4.4.3 n-mode, 40 MHz CBW mode, BPSK modulation, 13.5 / 15.0 Mbps data rate



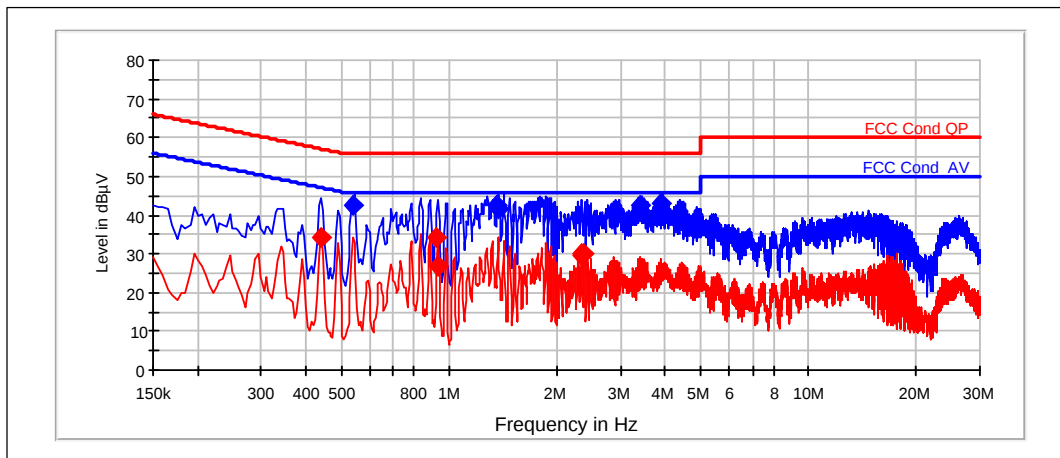
QuasiPeak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
1.365	43.42	L1	PASSED
1.85	36.83	L1	PASSED
3.395	40.36	L1	PASSED
3.435	39.77	L1	PASSED
3.88	39.45	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.44	35.15	L1	PASSED
0.92	31.87	L1	PASSED
1.405	24.89	L1	PASSED
2.425	29.15	L1	PASSED
2.945	28.95	L1	PASSED

4.4.4 n-mode, 40 MHz CBW mode, 16-QAM modulation, 81.0 / 90.0 Mbps data rate



QuasiPeak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.54	42.71	L1	PASSED
1.355	42.62	L1	PASSED
1.37	41.57	L1	PASSED
3.4	42.75	L1	PASSED
3.875	43.1	L1	PASSED

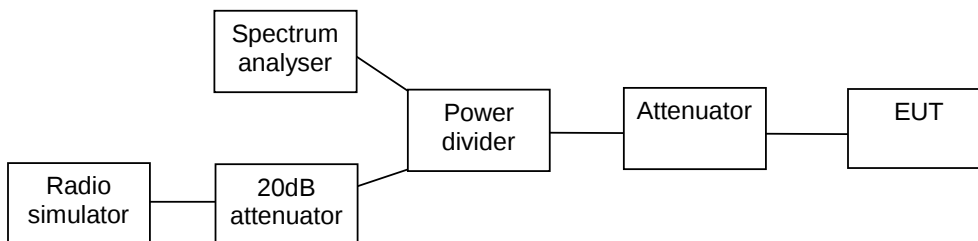
Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.44	34.38	L1	PASSED
0.925	34.16	L1	PASSED
0.93	26.9	L1	PASSED
2.325	30.08	L1	PASSED
2.33	29.6	L1	PASSED
2.375	30.18	L1	PASSED

5. 6 dB bandwidth (FCC §15.247(a)(2), RSS-210 A8.2 (1))

EUT with DUT number	RM-892, DUT 17376
Accessories with DUT numbers	WH-208, DUT 17375
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 33 / 100.5
Date of measurements	30-Apr-2013
Measured by	Jari Keto

5.1. Test Setup



5.2. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-210.

Limits for 6 dB bandwidth measurements

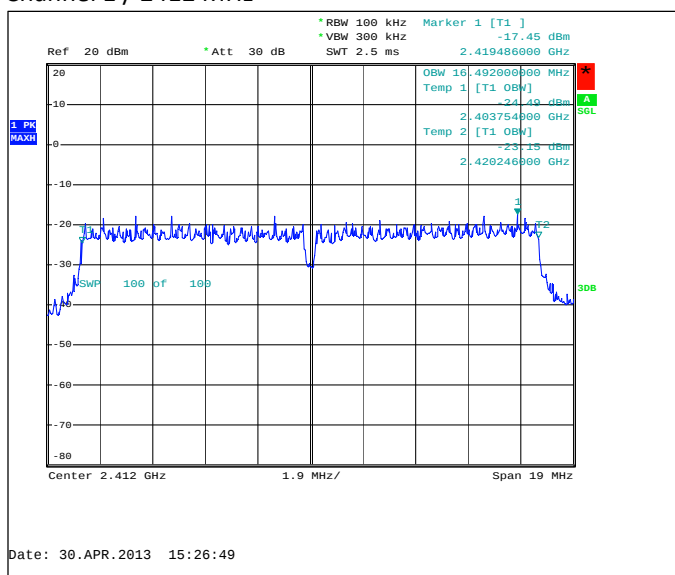
Limit [kHz]
>= 500

5.3. WLAN Test results

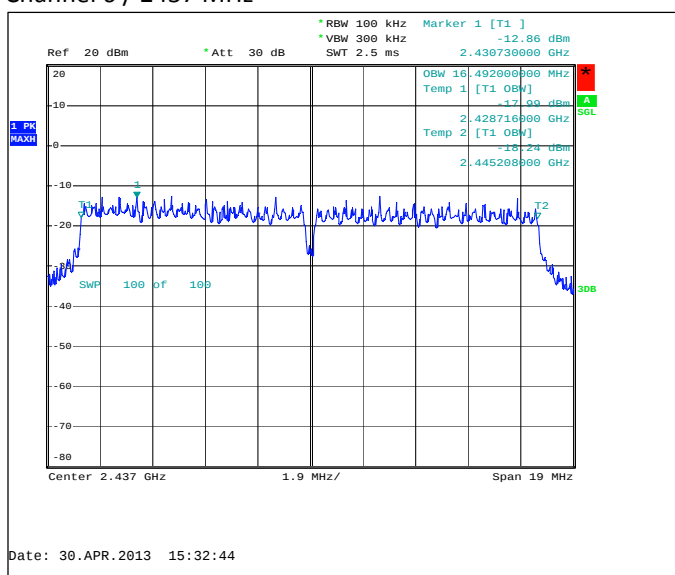
5.3.1 802.11g mode, BPSK modulation, 6 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	16492	PASSED
6 / 2437	16492	PASSED
11 / 2462	16454	PASSED

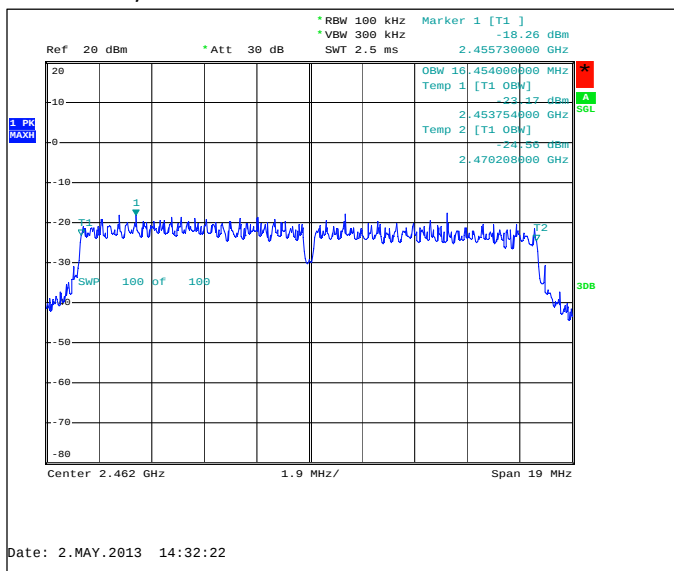
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



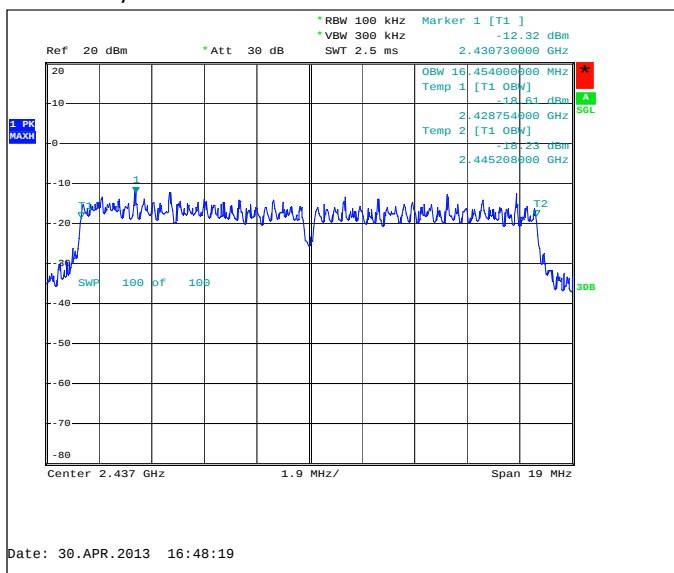
Channel 11 / 2462 MHz



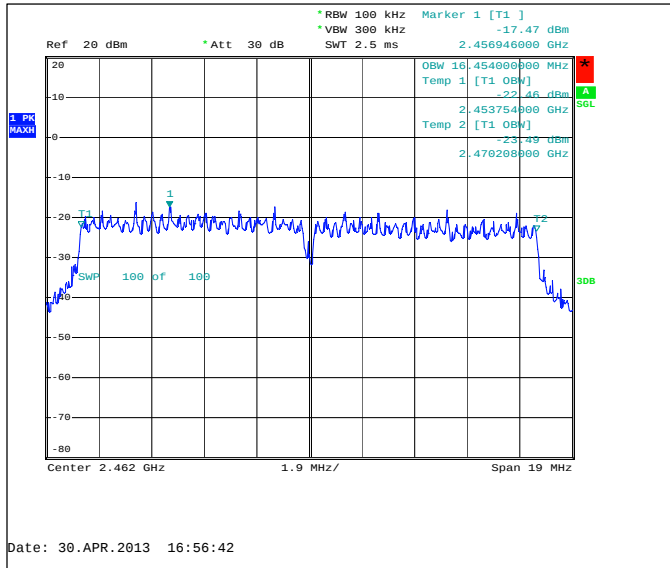
5.3.2 802.11g mode, QPSK modulation, 18 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
6 / 2437	16454	PASSED
11 / 2462	16454	PASSED
1 / 2412	16454	PASSED

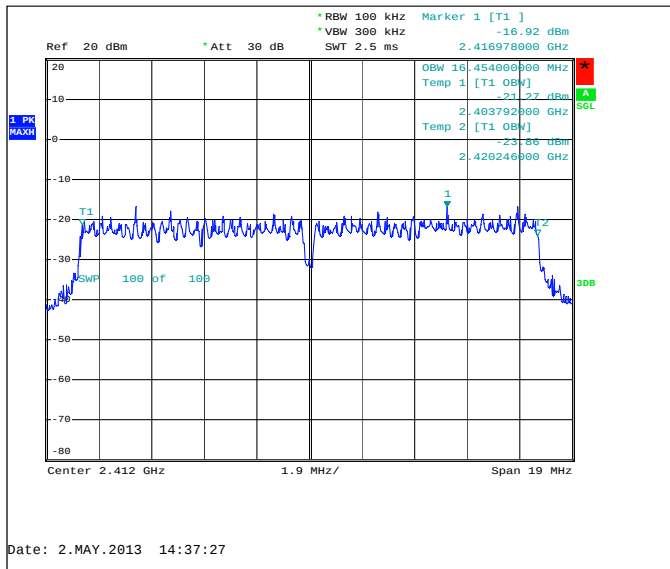
Channel 6 / 2437 MHz



Channel 11 / 2462 MHz



Channel 1 / 2412 MHz

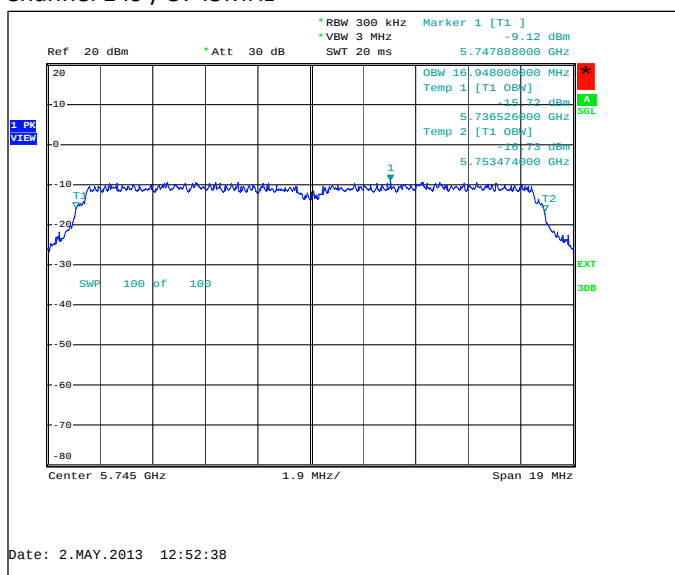


5.4. 5 GHz RLAN Test results

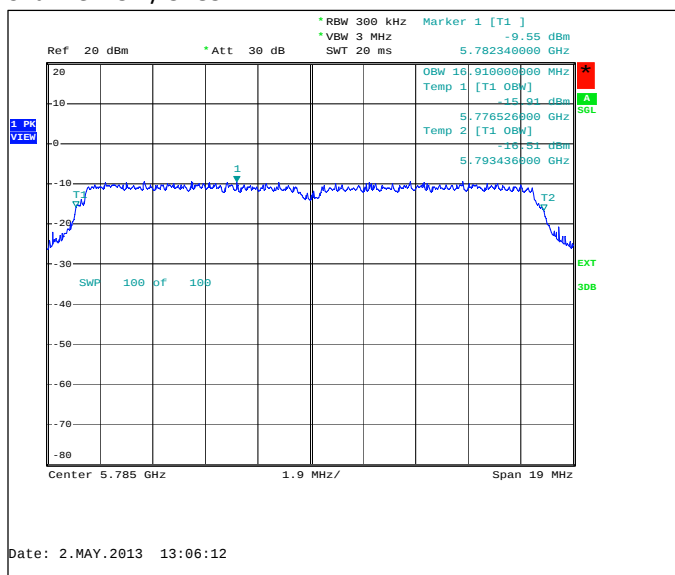
5.4.1 802.11g mode, BPSK modulation, 6 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
149 / 5745	16948	PASSED
157 / 5785	16910	PASSED
165 / 5825	16910	PASSED

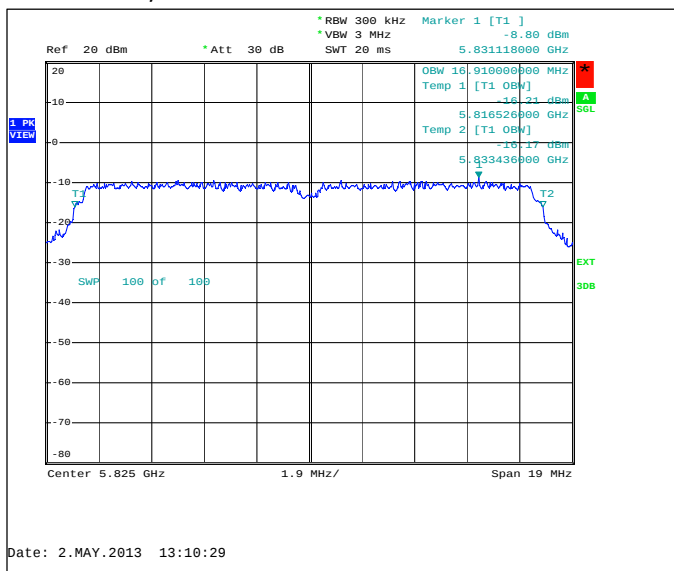
Channel 149 / 5745MHz



Channel 157 / 5785MHz



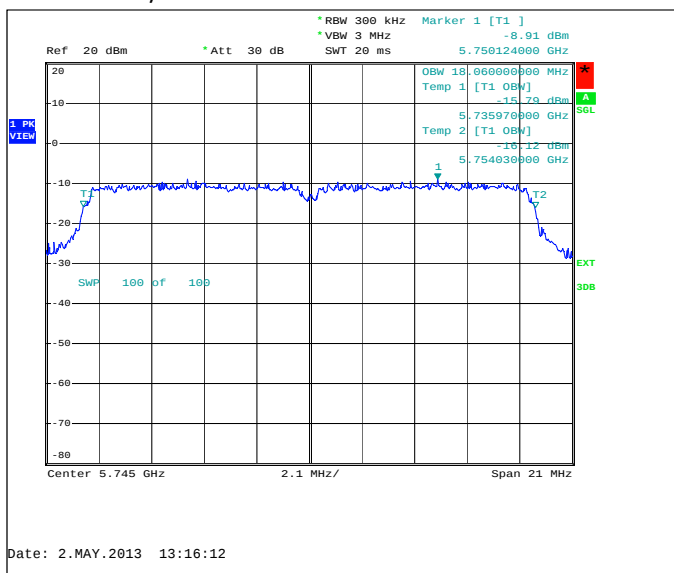
Channel 165 / 5825MHz



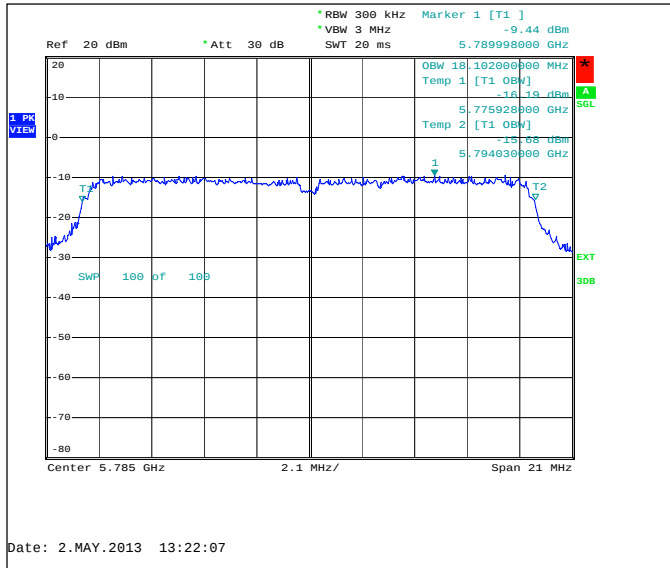
5.4.2 802.11n mode, QPSK modulation, 19.5 / 21.7 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
149 / 5745	18060	PASSED
157 / 5785	18102	PASSED
165 / 5825	18102	PASSED

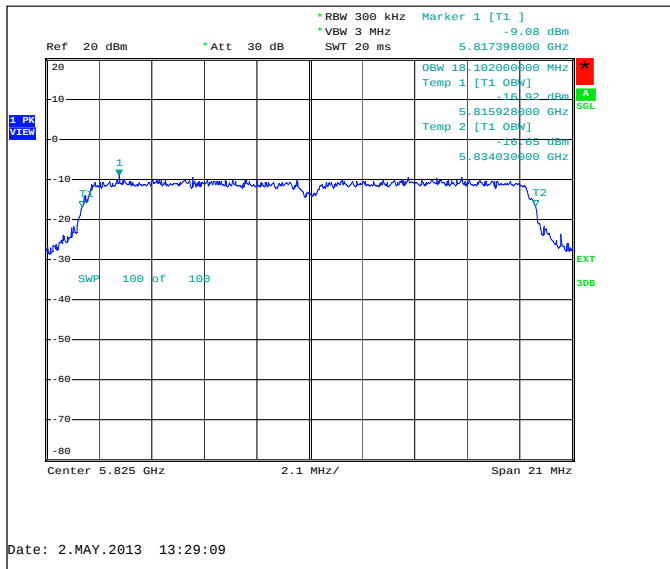
Channel 149 / 5745MHz



Channel 157 / 5785MHz



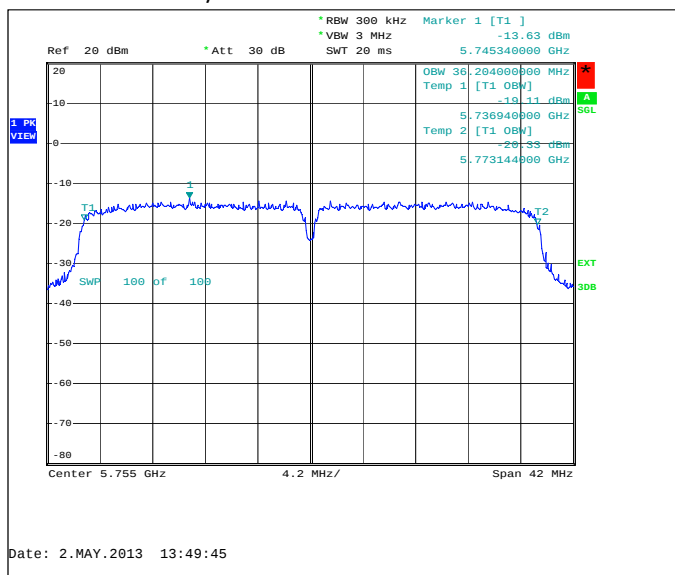
Channel 165 / 5825MHz



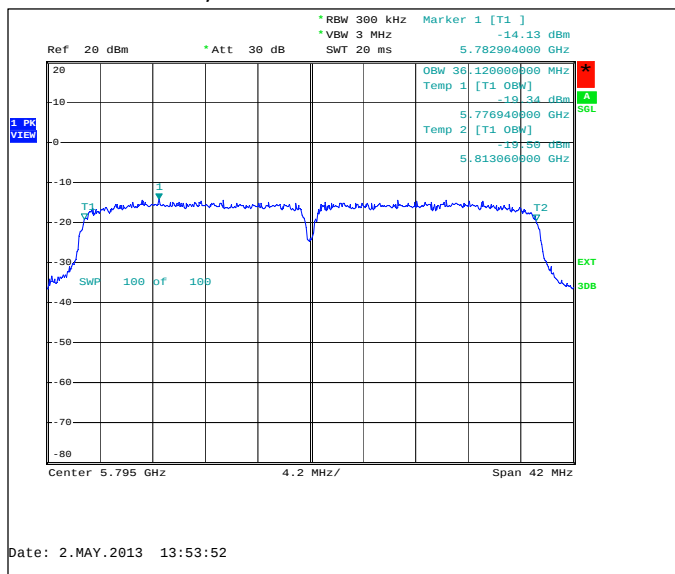
5.4.3 802.11n mode, BPSK modulation, 13.5 / 15.0 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
149+153 / 5755	36204	PASSED
157+161 / 5795	36120	PASSED

Channel 149+153 / 5755MHz



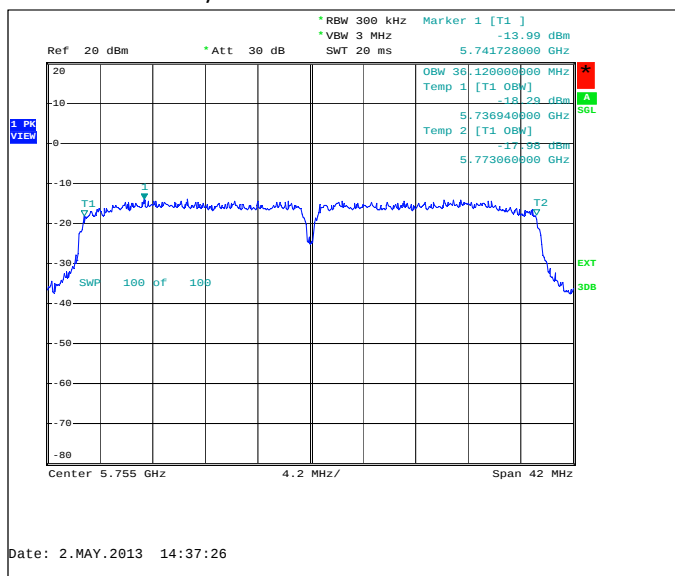
Channel 157+161 / 5795MHz



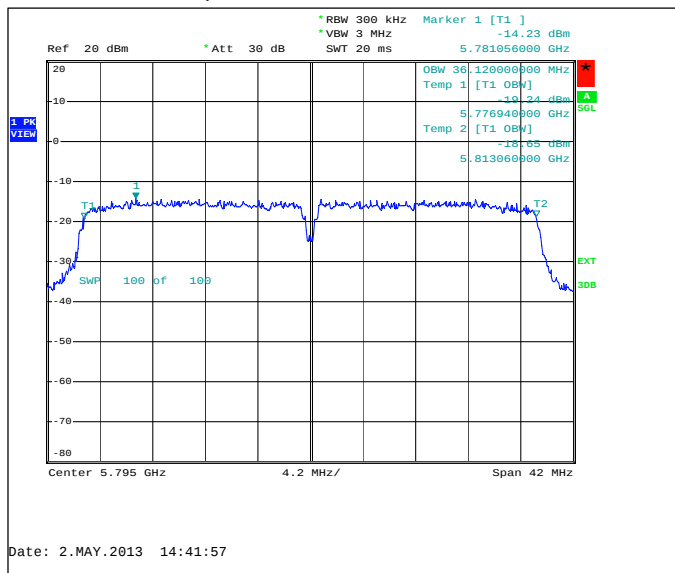
5.4.4 802.11n mode, 16QAM modulation, 81.0 / 90.0 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
149+153 / 5755	36120	PASSED
157+161 / 5795	36120	PASSED

Channel 149+153 / 5755MHz



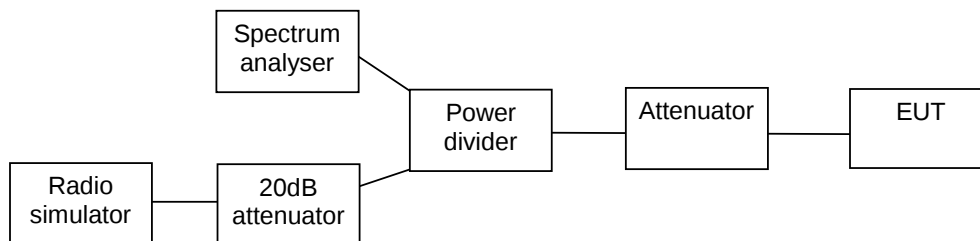
Channel 157+161 / 5795MHz



6. Power spectral density (FCC §15.247(e), RSS-210 A8.2 (2))

EUT with DUT number	RM-892, DUT 17376
Accessories with DUT numbers	WH-208, DUT 17375
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 33 / 100.5
Date of measurements	30-Apr-2013
Measured by	Jari Keto

6.1. Test Setup



6.2. Test method and limit

The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-210.

Result is corrected by bandwidth correction factor -15.2dB (BWCF = $10\log(3\text{ kHz}/100\text{ kHz}) = -15.2\text{ dB}$)).

Limits for power spectral density measurements

Limit [dBm] @ 3 kHz
≤ 8

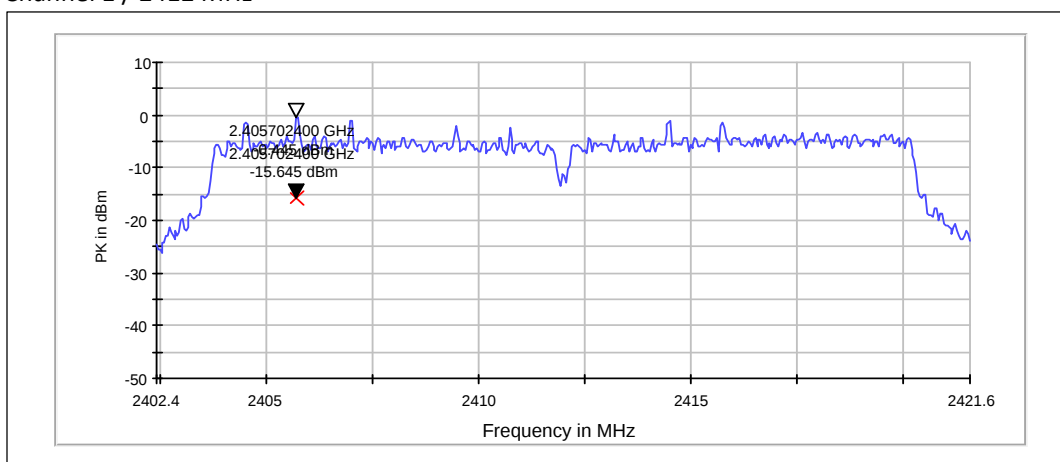
6.3. WLAN Test results

6.3.1 802.11g mode, BPSK modulation, 6 Mbps data rate

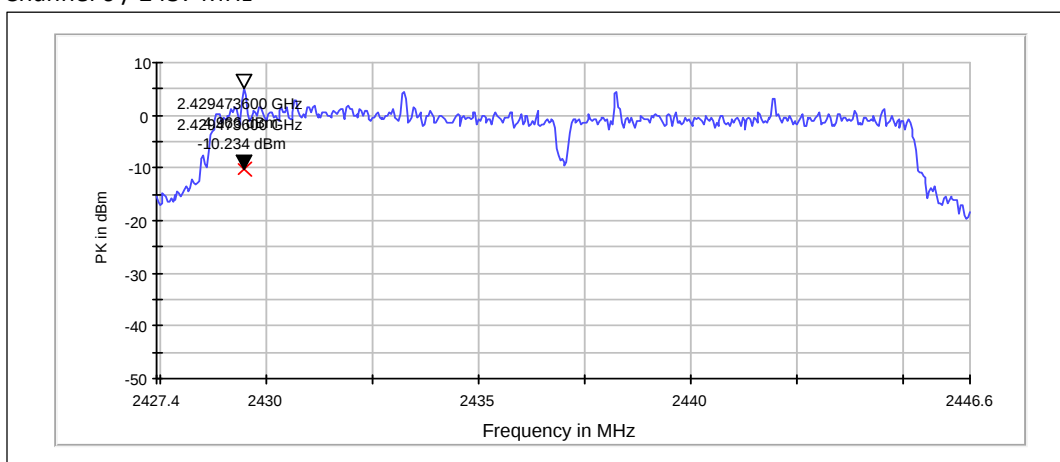
Peak (RBW: 100 kHz, VBW: 300 kHz, Max hold)

Channel / f _c [MHz]	P [dBm]	Result
1 / 2412	-15.64	PASSED
6 / 2437	-10.23	PASSED
11 / 2462	-15.63	PASSED

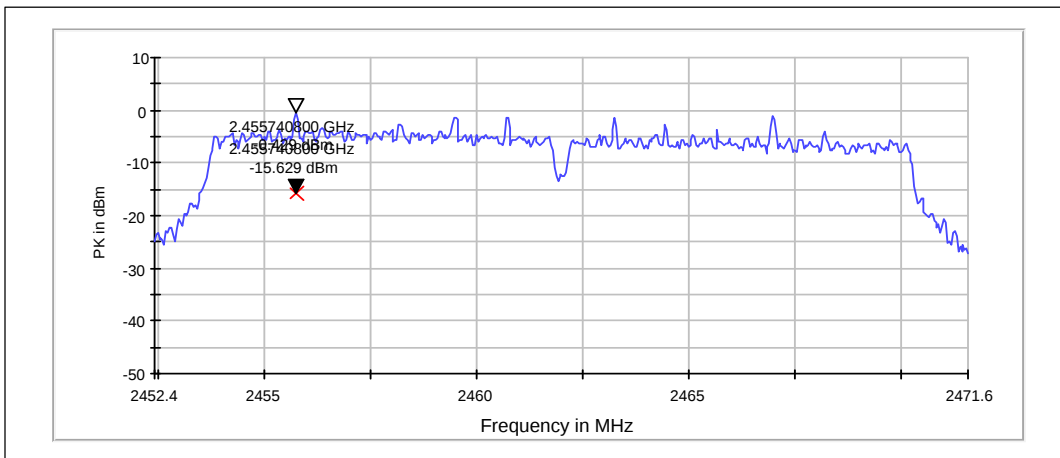
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



Channel 11 / 2462 MHz

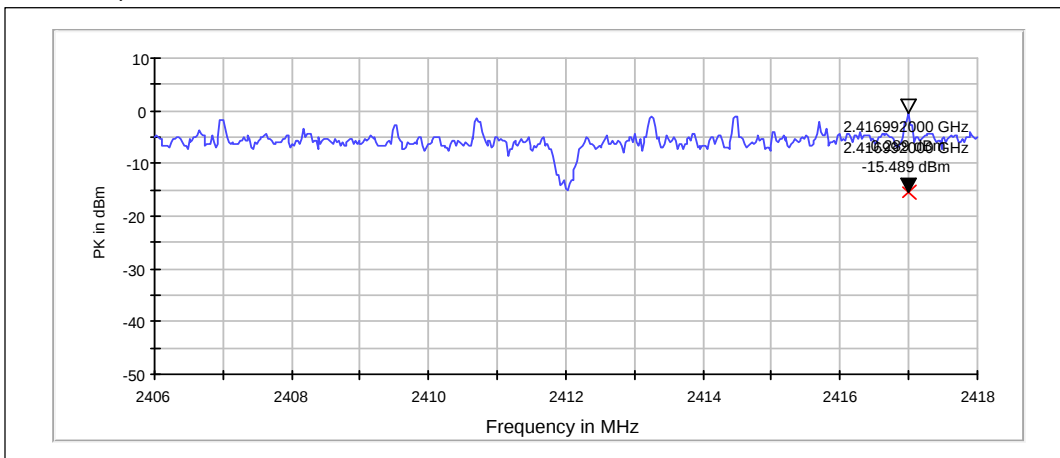


6.3.2 802.11g mode, QPSK modulation, 18 Mbps data rate

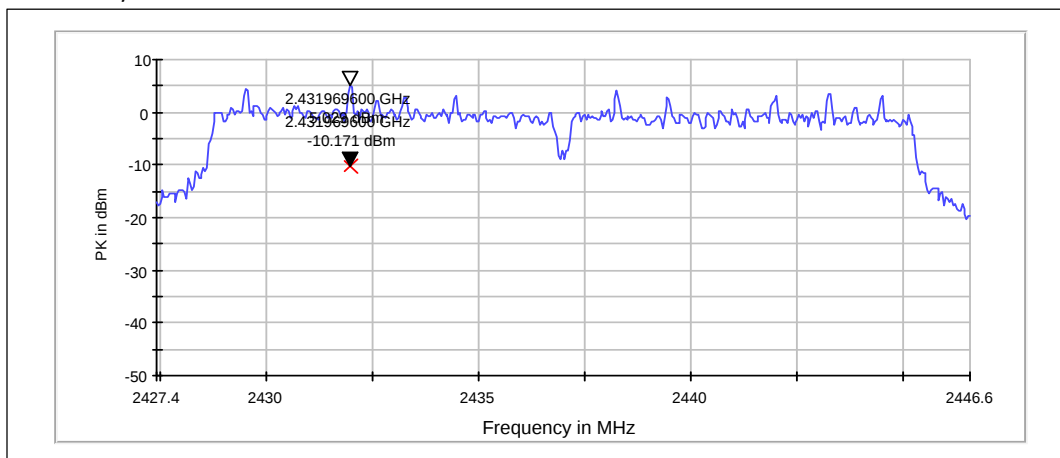
Peak (RBW: 100 kHz, VBW: 300 kHz, Max hold)

Channel / f _c [MHz]	P [dBm]	Result
1 / 2412	-15.49	PASSED
6 / 2437	-10.17	PASSED
11 / 2462	-15.35	PASSED

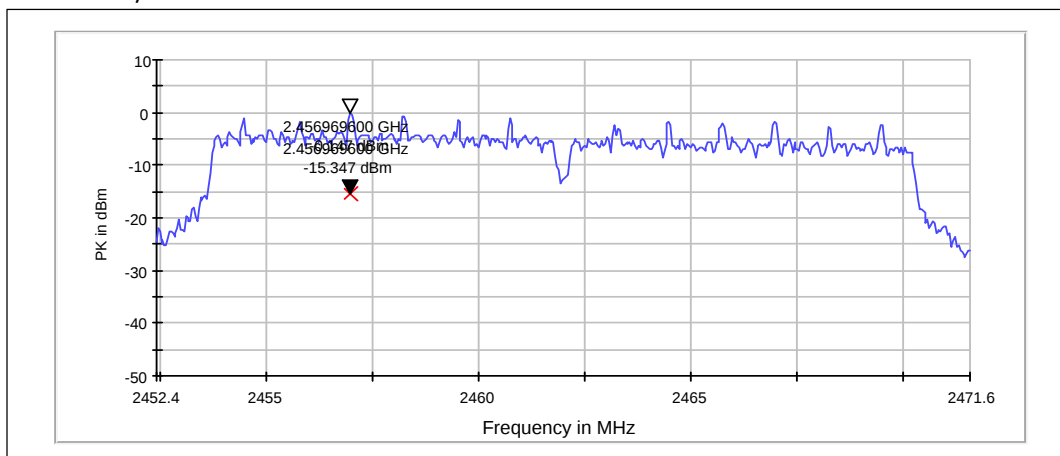
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



Channel 11 / 2462 MHz



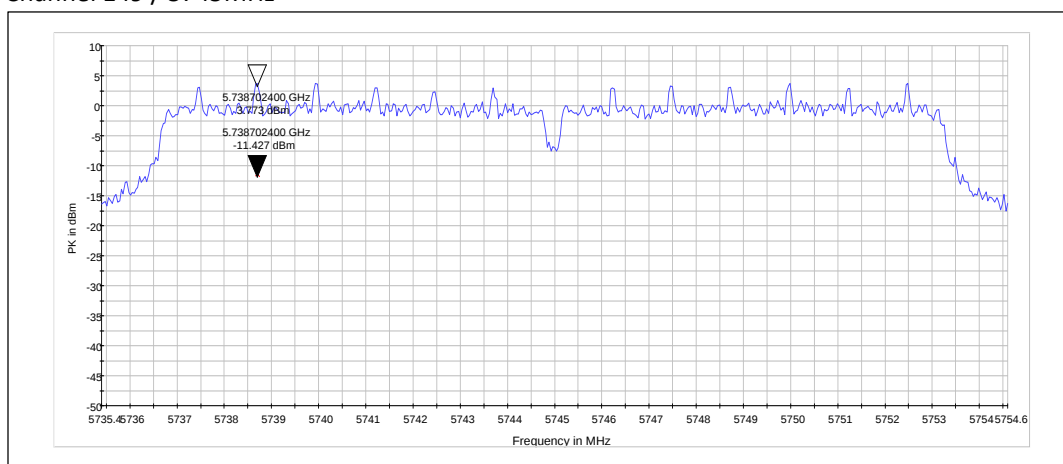
6.4. 5 GHz RLAN Test results

6.4.1 802.11g mode, BPSK modulation, 6 Mbps data rate

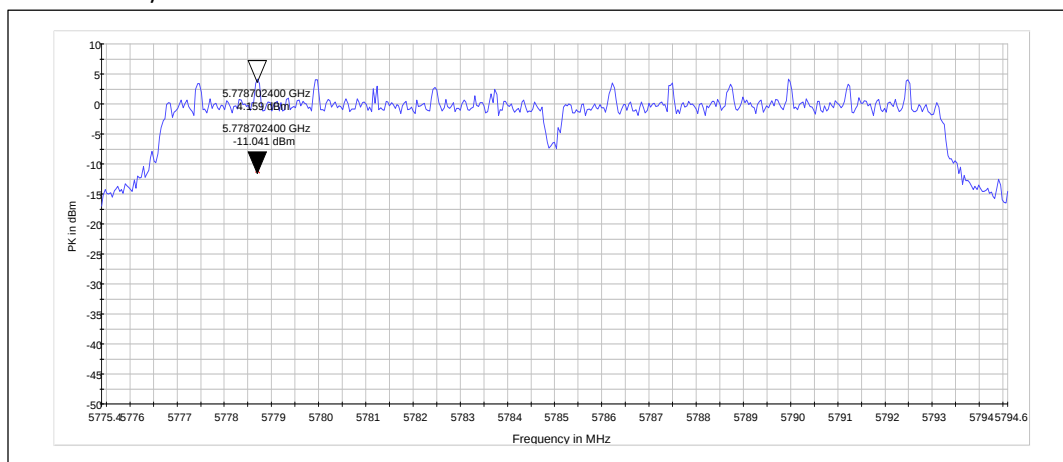
Peak (RBW: 100 kHz, VBW: 300 kHz, Max hold)

Channel / f _c [MHz]	P [dBm]	Result
149 / 5745	-11.43	PASSED
157 / 5785	-11.04	PASSED
165 / 5825	-11.24	PASSED

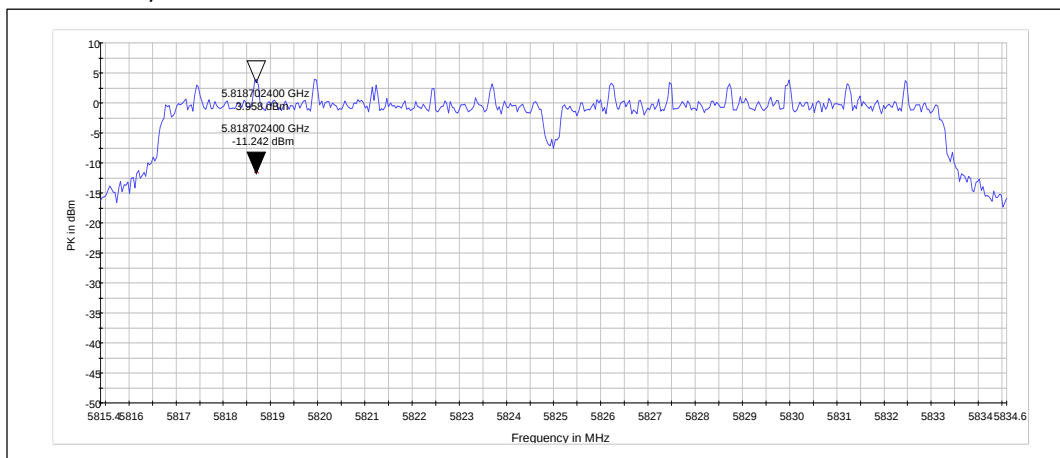
Channel 149 / 5745MHz



Channel 157 / 5785MHz



Channel 165 / 5825MHz

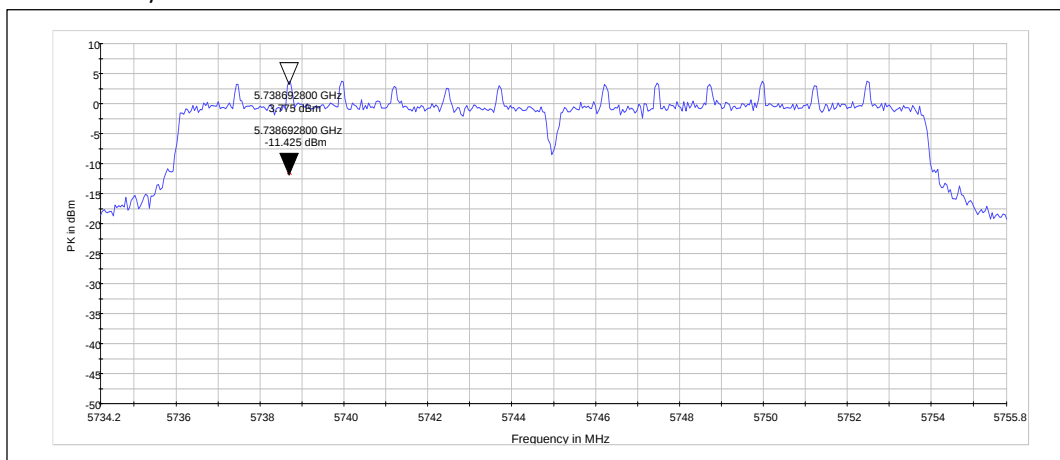


6.4.2 802.11n mode, QPSK modulation, 19.5 / 21.7 Mbps data rate

Peak (RBW: 100 kHz, VBW: 300 kHz, Max hold)

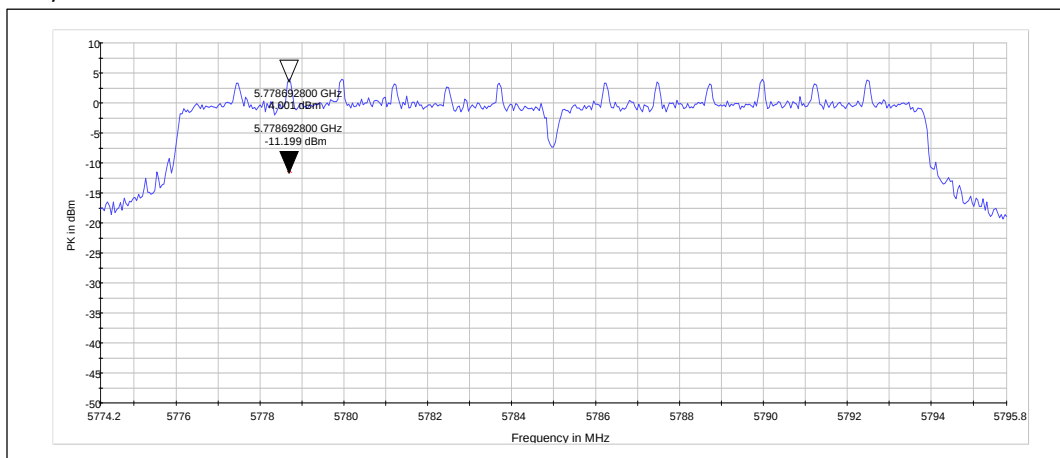
Channel / f _c [MHz]	P [dBm]	Result
149 / 5745	-11.43	PASSED
157 / 5785	-11.2	PASSED
165 / 5825	-11.3	PASSED

Channel 149 / 5745MHz

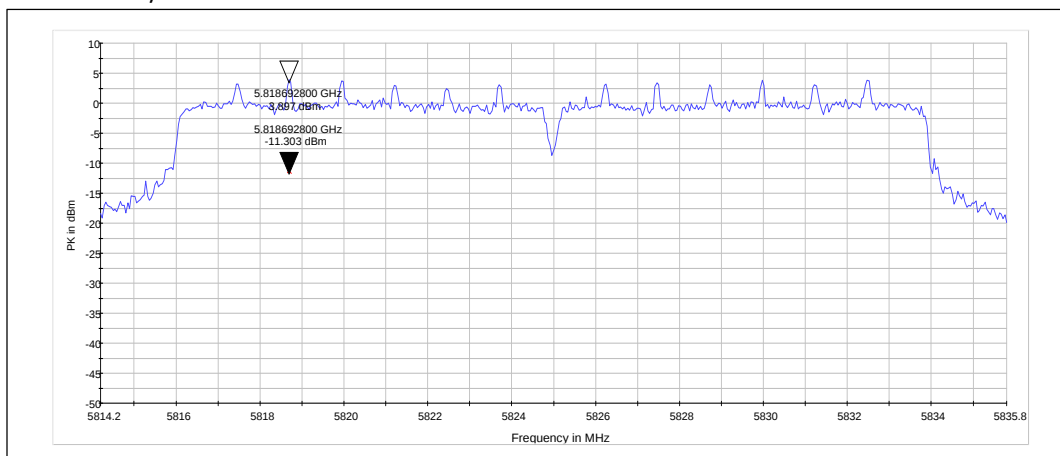


Channel

157 / 5785MHz



Channel 165 / 5825MHz

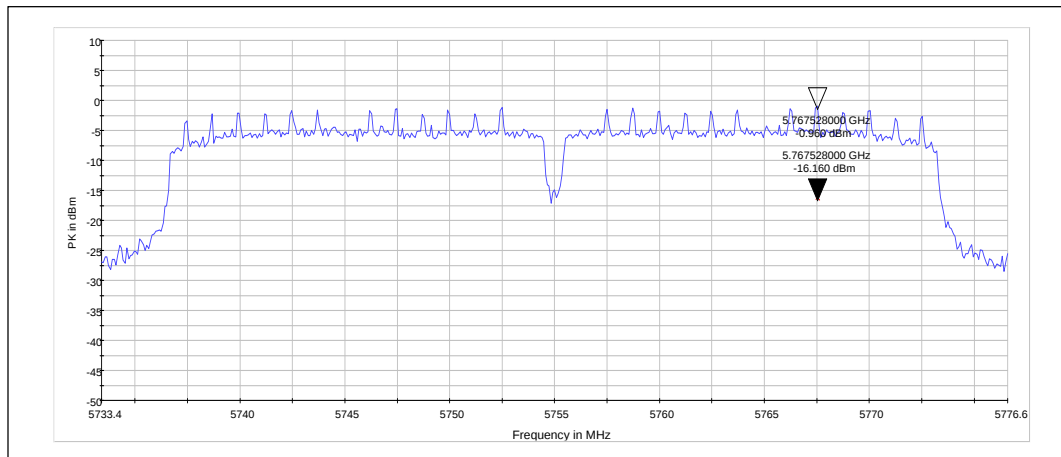


6.4.3 802.11n mode, BPSK modulation, 13.5 / 15.0 Mbps data rate

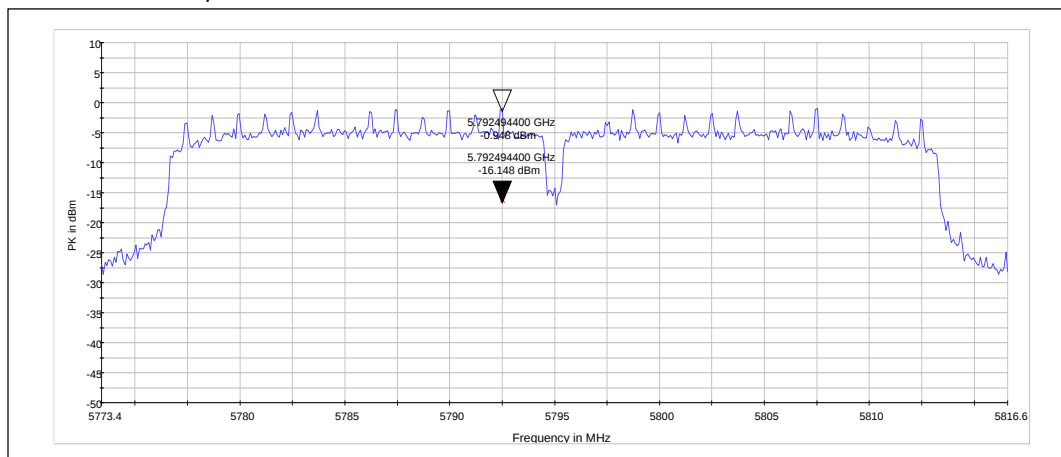
Peak (RBW: 100 kHz, VBW: 300 kHz, Max hold)

Channel / f _c [MHz]	P [dBm]	Result
149+153 / 5755	-16.16	PASSED
157+161 / 5795	-16.15	PASSED

Channel 149+153 / 5755MHz



Channel 157+161 / 5795MHz

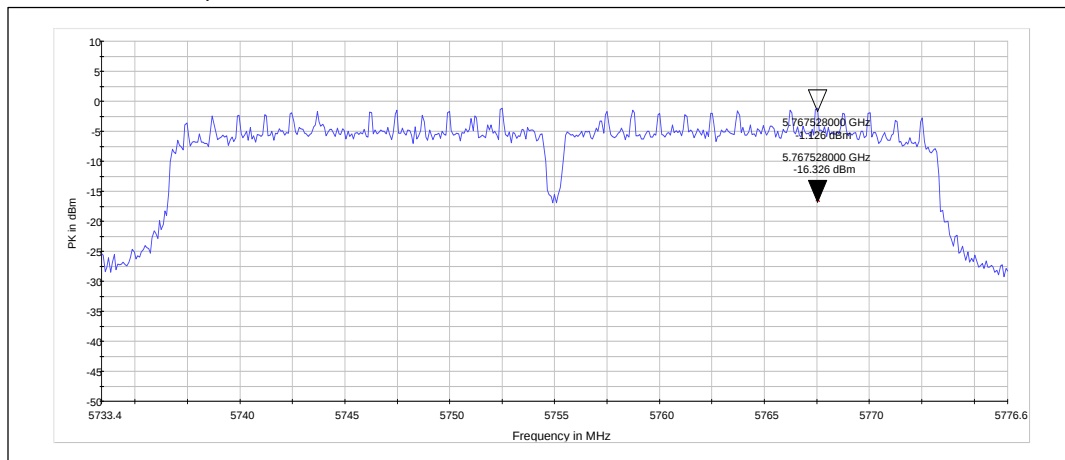


6.4.4 802.11n mode, 16QAM modulation, 81.0 / 90.0 Mbps data rate

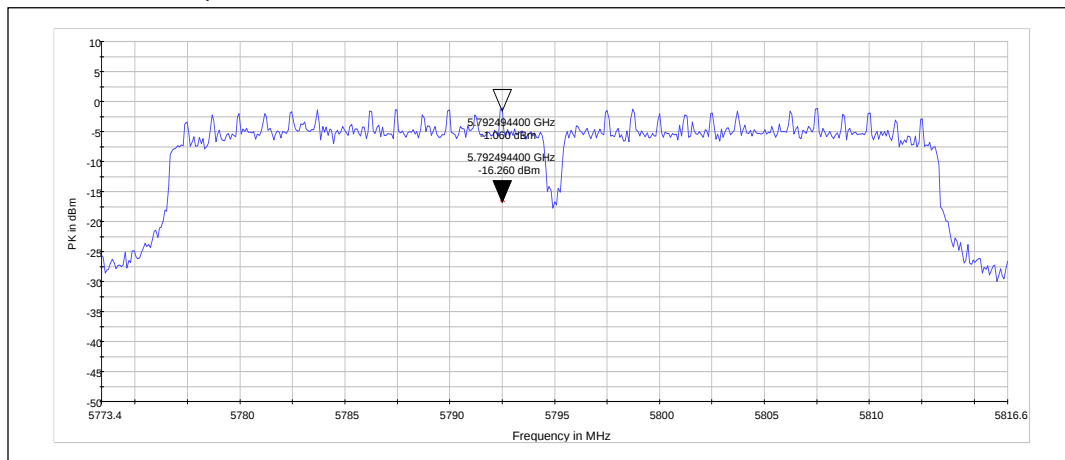
Peak (RBW: 100 kHz, VBW: 300 kHz, Max hold)

Channel / f _c [MHz]	P [dBm]	Result
149+153 / 5755	-16.33	PASSED
157+161 / 5795	-16.26	PASSED

Channel 149+153 / 5755MHz



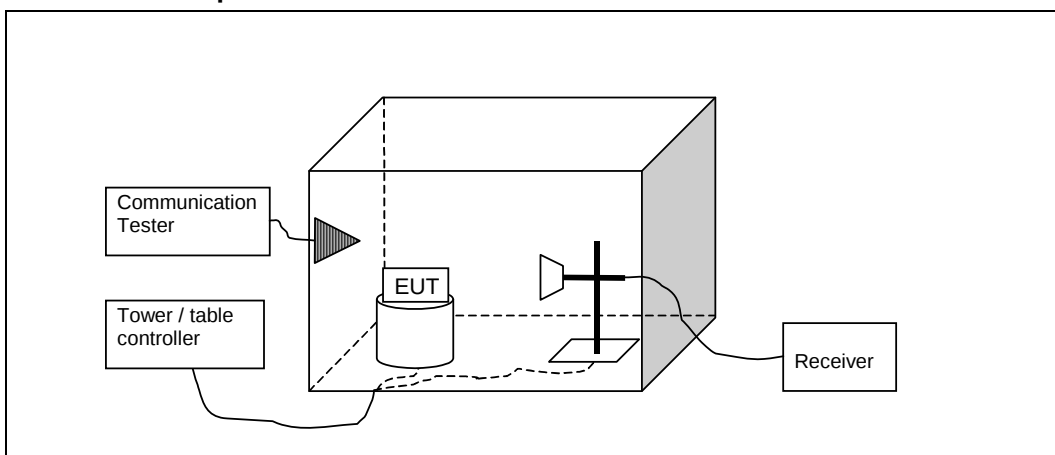
Channel 157+161 / 5795MHz



7. Band edge compliance of RF emissions (FCC §15.247(d), 15.205(b), RSS-210 A8.5)

EUT with DUT number	RM-892, DUT 17369
Accessories with DUT numbers	BL-4YW, DUT 17356 ; WH-208, DUT 17346 ; AC-50E, DUT 17350
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 45 / 101.4
Date of measurements	08-May-2013
Measured by	Kalle Hannila

7.1.1 Test setup



7.2. Test method and limit

The measurement is made according to KDB558074 and IC standard RSS-210.

The limit for 5 GHz RLAN is -20 dBc.

When the fundamental value in E [dBuV/m] column is at least 20 dB higher than the out of band emission, the result is pass.

The measurement results are obtained as described below:

$$E [dB\mu V/m] = U_{RX} + A_{TOT}$$

Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable loss, antenna factor and preamplifier gain ($A_{TOT} = L_{CABLES} + A_F - G_{PREAMP}$).

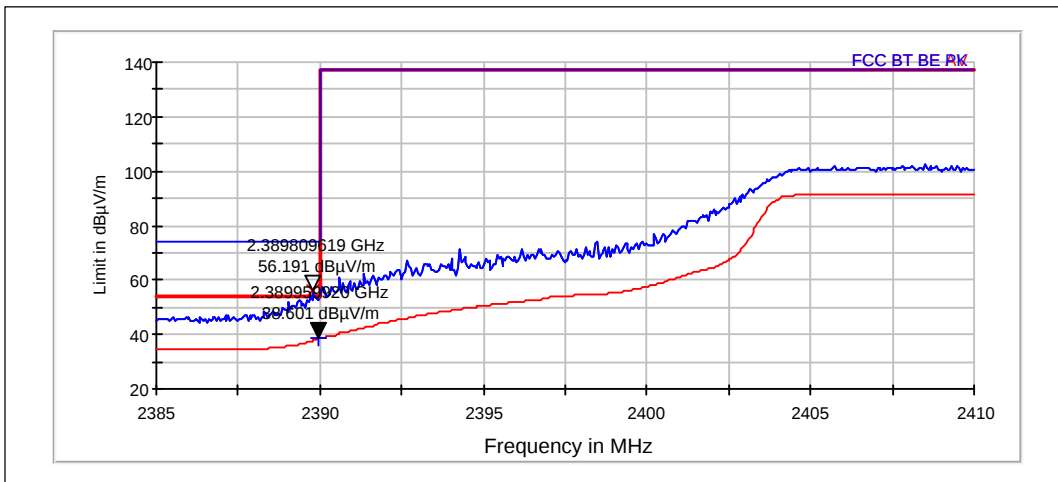
Limits for band edge compliance of RF emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit
Below 2390 and above 2483.5	54 dBuV/m (avg) and 74 dBuV/m (pk)
Below 5725 and above 5825	-20dBc

7.3. WLAN test results

7.3.1 802.11g, BPSK modulation, 6 Mbps data rate.

Channel 1 / 2412 MHz



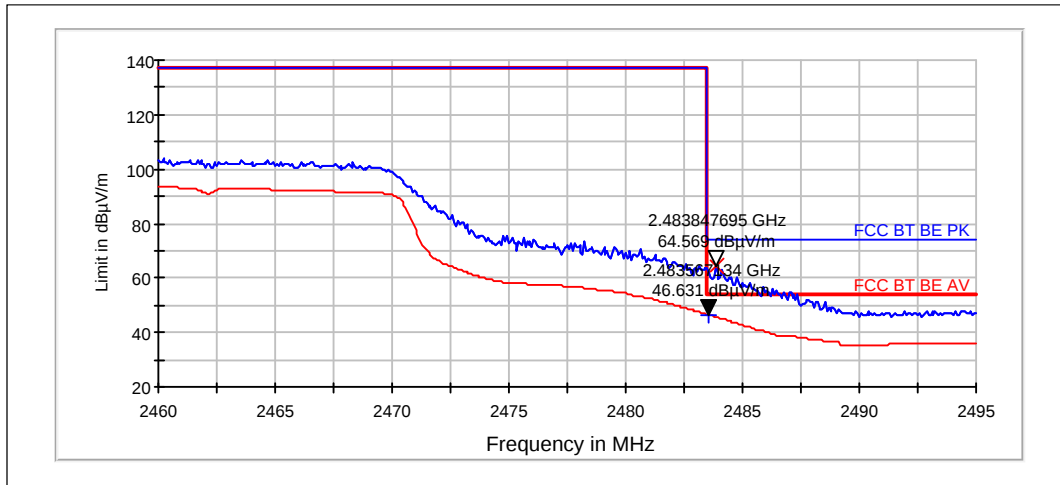
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Correction [dB]	Results
2390	56.19	644.986	55.73	0.46	0.46	PASSED

Average (RBW: 1 MHz, VBW: 10 Hz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Correction [dB]	Results
2390	38.6	85.124	38.14	0.46	0.46	PASSED

Channel 11 / 2462 MHz



Peak (RBW: 1 MHz, VBW: 1 MHz)

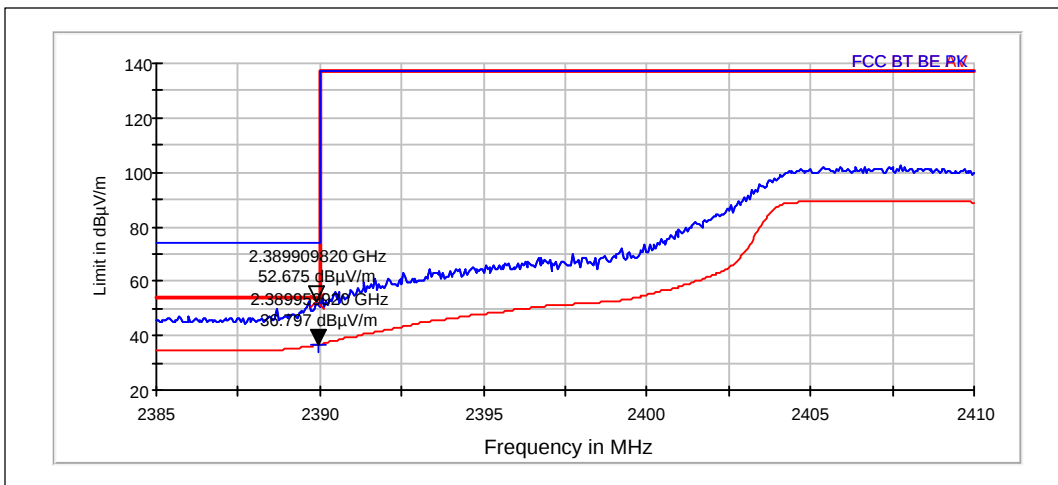
Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Correction [dB]	Results
2484	64.57	1692.193	63.98	0.6	0.595	PASSED

Average (RBW: 1 MHz, VBW: 10 Hz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Correction [dB]	Results
2484	46.63	214.561	46.04	0.6	0.595	PASSED

7.3.2 802.11g, QPSK modulation, 18 Mbps data rate.

Channel 1 / 2412 MHz



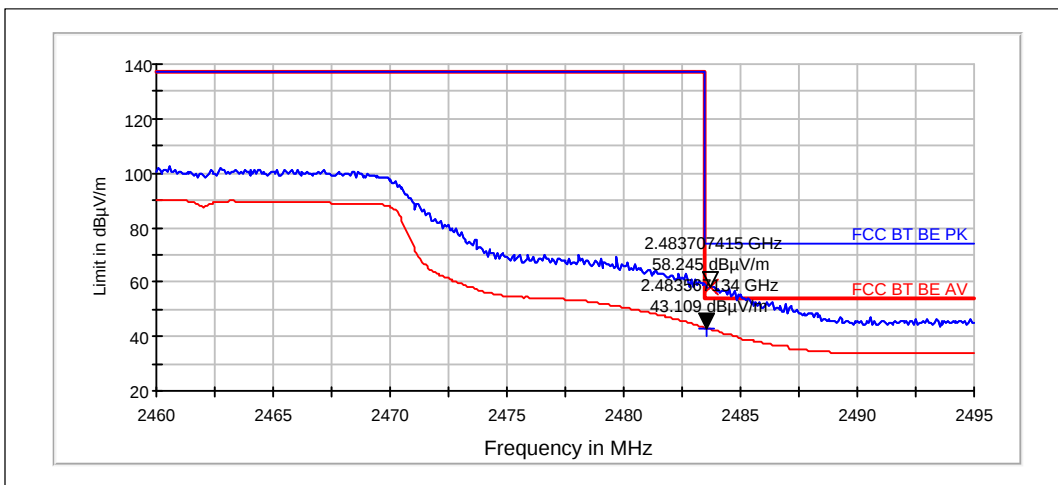
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Correction [dB]	Results
2390	52.68	430.279	52.22	0.46	0.46	PASSED

Average (RBW: 1 MHz, VBW: 10 Hz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Correction [dB]	Results
2390	36.8	69.159	36.34	0.46	0.46	PASSED

Channel 11 / 2462 MHz



Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Correction [dB]	Results
2484	58.25	817.053	57.66	0.6	0.595	PASSED

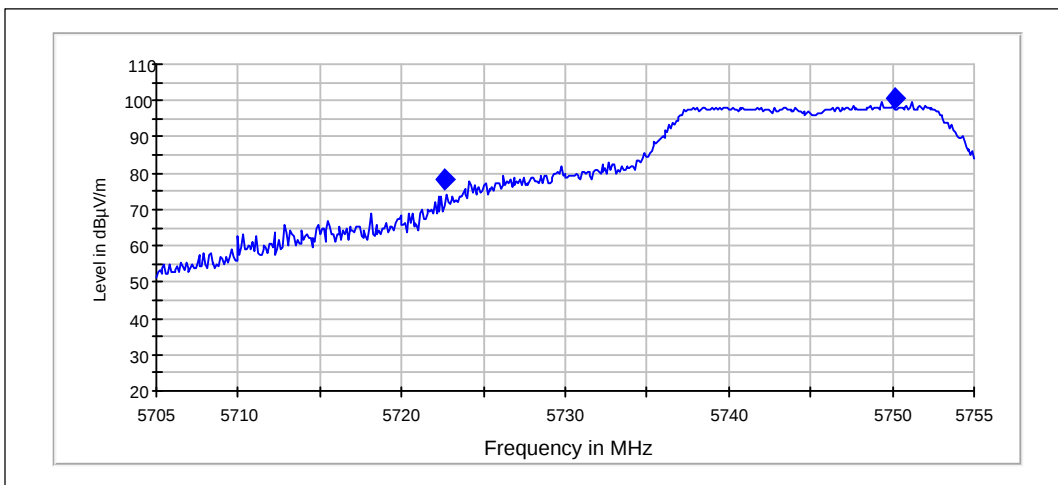
Average (RBW: 1 MHz, VBW: 10 Hz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Correction [dB]	Results
2484	43.11	143.038	42.52	0.6	0.595	PASSED

7.4. 5 GHz RLAN test results

7.4.1 802.11g, BPSK modulation, 6 Mbps data rate.

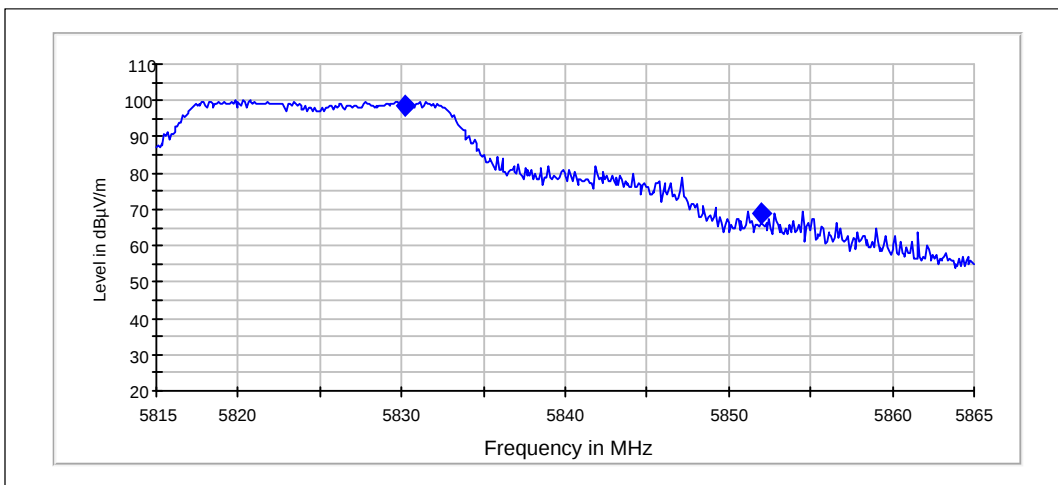
Channel 149 / 5745MHz



Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
5722.635	78.14	8067.705	73.94	4.2	PASSED
5750.19	100.62	107374.215	96.42	4.2	PASSED

Channel 165 / 5825MHz

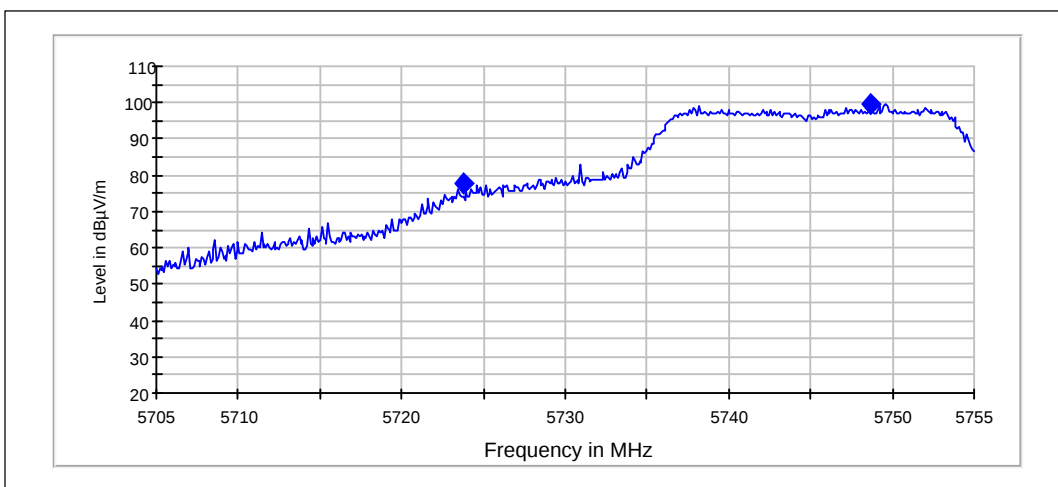


Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
5830.19	98.79	86966.101	94.12	4.67	PASSED
5851.954	69.13	2861.212	64.32	4.82	PASSED

7.4.2 802.11n, QPSK modulation, 19.5 / 21.7 Mbps data rate.

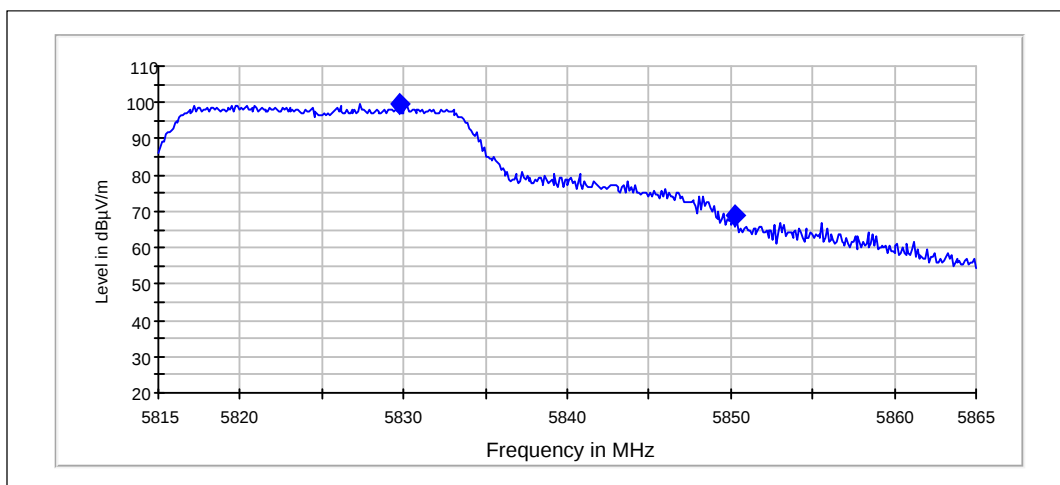
Channel 149 / 5745MHz



Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
5723.758	77.97	7919.541	73.77	4.21	PASSED
5748.707	99.8	97701.223	95.6	4.21	PASSED

Channel 165 / 5825MHz

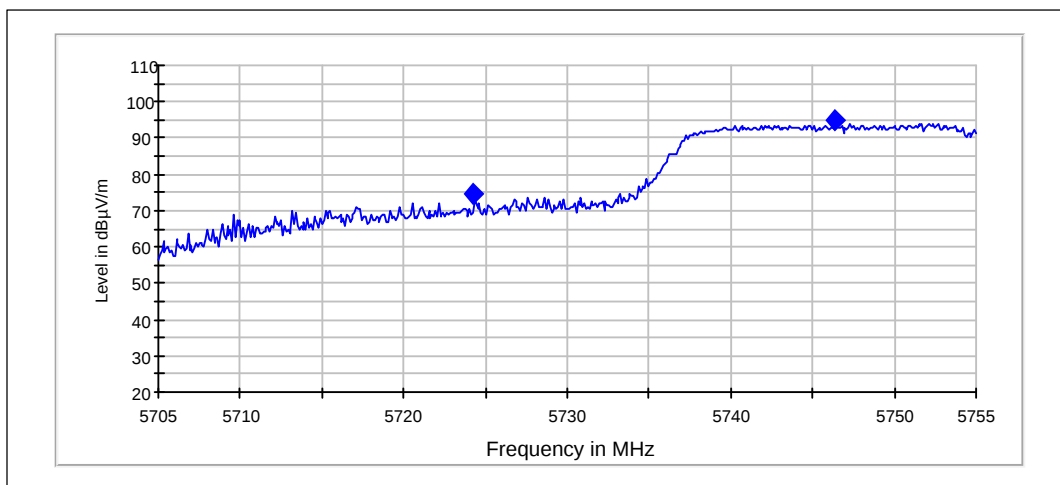


Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
5829.709	99.72	96861.235	95.05	4.67	PASSED
5850.21	69.13	2861.541	64.32	4.81	PASSED

7.4.3 802.11n, BPSK modulation, 13.5 / 15.0 Mbps data rate.

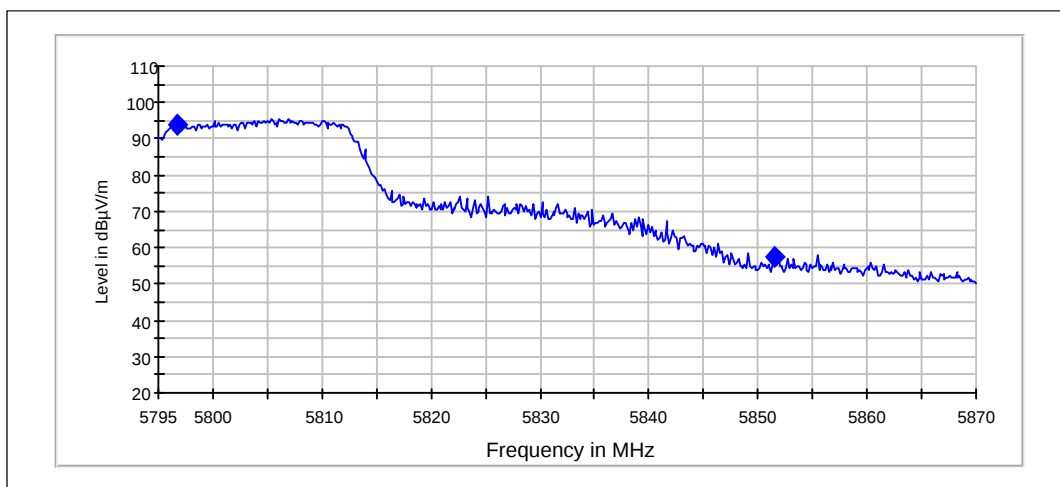
Channel 149+153 / 5755MHz



Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
5724.279	74.8	5493.511	70.59	4.21	PASSED
5746.343	95	56227.659	90.79	4.21	PASSED

Channel 157+161 / 5795MHz

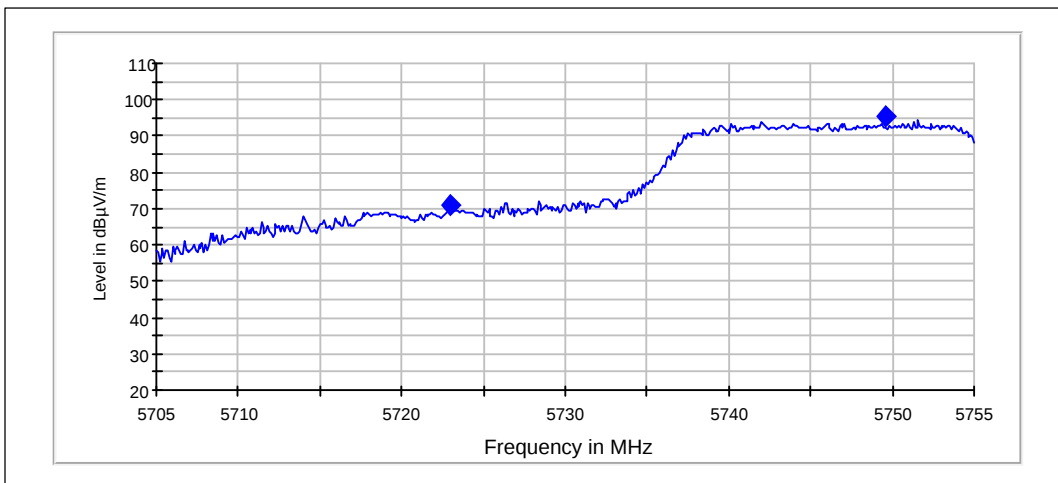


Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
5796.643	94.13	50886.198	89.69	4.45	PASSED
5851.443	57.55	754.397	52.74	4.81	PASSED

7.4.4 802.11n, 16QAM modulation, 81.0 / 90.0 Mbps data rate.

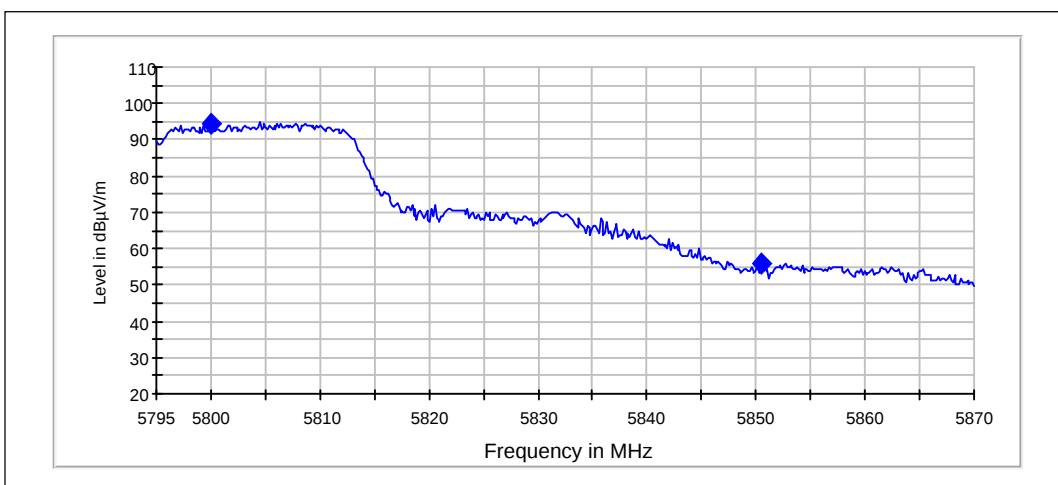
Channel 149+153 / 5755MHz



Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
5722.956	71.11	3592.527	66.91	4.2	PASSED
5749.589	95.32	58357.946	91.12	4.2	PASSED

Channel 157+161 / 5795MHz



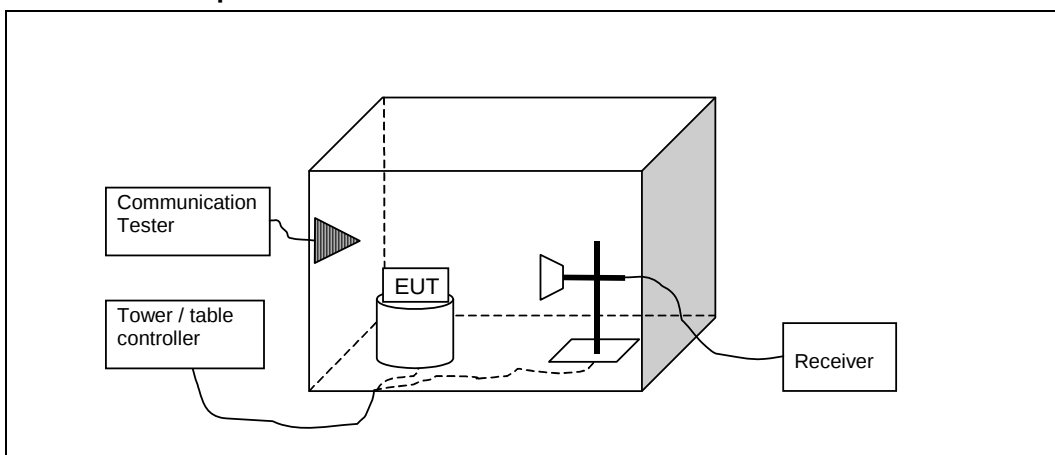
Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
5800.01	94.18	51162.293	89.71	4.47	PASSED
5850.481	55.64	605.48	50.83	4.81	PASSED

8. Spurious radiated emissions (FCC §15.247(d), §15.209, RSS-210 A8.5)

EUT with DUT number	RM-892, DUT 17369
Accessories with DUT numbers	BL-4YW, DUT 17356 ; WH-208, DUT 17346 ; AC-50E, DUT 17350
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 45 / 101.4
Date of measurements	08-May-2013
Measured by	Kalle Hannila

8.1.1 Test setup



8.2. Test method and limit

The measurement is made according to ANSI C63.4 and IC standard RSS-210 as follows:
The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed in the Semi-Anechoic Chamber with conducting metal floor, if the Preliminary Measurement results are closer than 20 dB to the permissible value.

The EUT is placed at nonconductive plate at the turntable center.

For each suspected frequency, the turntable is rotated 360 degrees and antenna is scanned from 1 to 4 m. This is repeated for both horizontal and vertical receive antenna polarizations.

The emissions less than 20 dB below the permissible value are reported.

The measurement results are obtained as described below:

$$E [dB\mu V/m] = U_{RX} + A_{TOT}$$

Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable loss, antenna factor and preamplifier gain ($A_{TOT} = L_{CABLES} + A_F - G_{PREAMP}$).

Limits for spurious radiated emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit [$\mu V/m$]	Limit [$dB\mu V/m$]	Detector
30 - 88	100	40	Quasi peak
88 – 216	150	43.5	Quasi peak
216 – 960	200	46	Quasi peak
960 – 1000	500	54	Quasi peak
Above 1000	500	54	Average
Above 1000	5000	74	Peak

8.3. WLAN test results

8.3.1 802.11g, BPSK modulation, 6 Mbps data rate.

Channel 1 / 2412 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4825.7	40.59	107.016	41.71	-1.12	33.4	74	PASSED
7235.9	47.27	230.808	43.09	4.18	78	125	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4825.7	27.34	23.276	28.46	-1.12	26.6	54	PASSED
7235.9	34.12	50.816	29.94	4.18	---	---	PASSED

Channel 6 / 2442 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4881.8	41	112.254	41.99	-0.99	33	74	PASSED
7320.2	47.2	229.113	42.54	4.66	26.8	74	PASSED
10982.262	55.12	569.967	41.99	13.13	18.9	74	PASSED
11514.531	55.06	566.174	42.27	12.79	18.9	74	PASSED

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
30.06	20.65	10.771	24.53	-3.88	19.4	40	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4881.8	28.13	25.483	29.12	-0.99	25.9	54	PASSED
7320.2	34.4	52.457	29.74	4.66	19.6	54	PASSED
10982.262	42.64	135.503	29.51	13.13	11.3	54	PASSED
11514.531	42.02	126.139	29.23	12.79	12	54	PASSED

Channel 11 / 2462 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4925.5	41.84	123.552	42.82	-0.98	32.1	74	PASSED
7386.3	48.68	271.55	43.45	5.23	25.3	74	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4925.5	28.32	26.05	29.3	-0.98	25.7	54	PASSED
7386.3	35.31	58.244	30.08	5.23	18.7	54	PASSED

8.3.2 802.11g, QPSK modulation, 18 Mbps data rate.

Channel 1 / 2412 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4822.3	40.44	105.184	41.57	-1.13	33.5	74	PASSED
7235	47.15	227.824	42.96	4.19	78.1	125	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4822.3	27.28	23.113	28.41	-1.13	26.7	54	PASSED
7235	34.13	50.857	29.94	4.19	---	---	PASSED

Channel 6 / 2442 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4878.6	39.97	99.609	40.97	-1	34	74	PASSED
7318	45.49	188.127	40.84	4.65	28.5	74	PASSED
11191.981	52.26	410.11	40.09	12.17	21.7	74	PASSED
11653.307	53.01	447.095	40.59	12.42	21	74	PASSED

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
30.06	20.11	10.131	23.99	-3.88	19.9	40	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
4878.6	27.16	22.796	28.16	-1	26.8	54	PASSED
7318	33.07	45.045	28.42	4.65	20.9	54	PASSED
11191.981	39.68	96.416	27.51	12.17	14.3	54	PASSED

11653.307	40.09	100.995	27.67	12.42	13.9	54	PASSED
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Channel 11 / 2462 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Margin	Limit [dB μ V/m]	Results
4925.3	40.35	104.136	41.33	-0.98	33.6	74	PASSED
7385.8	46.19	203.822	40.97	5.22	27.8	74	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Margin	Limit [dB μ V/m]	Results
4925.3	27.52	23.777	28.5	-0.98	26.5	54	PASSED
7385.8	33.48	47.201	28.26	5.22	20.5	54	PASSED

8.4. 5 GHz RLAN test results

8.4.1 802.11g, BPSK modulation, 6 Mbps data rate.

Channel 149 / 5745MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11489.8	59	891.251	46.15	12.85	15	74	PASSED
17234.2	51.2	363.162	41.29	9.91	74	125	PASSED
22972.3	55.23	577.431	40.08	15.15	18.7	74	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11489.8	50.82	347.376	37.97	12.85	3.2	54	PASSED
17234.2	38.19	81.227	28.28	9.91	---	---	PASSED
22972.3	42.66	135.878	27.51	15.15	11.3	54	PASSED

Channel 157 / 5785MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
10666.227	55.68	608.065	43.09	12.6	18.3	74	PASSED
11570	57.15	720.444	44.62	12.53	16.8	74	PASSED
11570.142	54.93	557.828	42.41	12.52	19	74	PASSED
17345.3	50.48	334.041	41.02	9.46	74.8	125	PASSED
23137.5	57.05	711.705	42	15.06	---	---	PASSED

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
30.33	20.71	10.847	24.95	-4.24	19.3	40	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
10666.227	42.55	134.137	29.96	12.6	11.4	54	PASSED
11570	46.36	207.874	33.83	12.53	7.6	54	PASSED
11570.142	42.21	129.033	29.69	12.52	11.8	54	PASSED
17345.3	37.33	73.536	27.87	9.46	---	---	PASSED
23137.5	44.41	166.112	29.36	15.06	---	---	PASSED

Channel 165 / 5825MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11650.1	58.78	869.161	46.7	12.09	15.2	74	PASSED
17439.5	50.85	348.739	41.16	9.7	74.4	125	PASSED
23292.3	56.9	700.164	41.99	14.91	---	---	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11650.1	49.46	297.167	37.38	12.09	4.5	54	PASSED
17439.5	37.72	76.94	28.03	9.7	---	---	PASSED
23292.3	44.02	158.818	29.11	14.91	---	---	PASSED

8.4.2 802.11n, QPSK modulation, 19.5 / 21.7 Mbps data rate.

Channel 149 / 5745MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11489.9	58.31	823	45.46	12.85	15.7	74	PASSED
17229.3	51.36	369.999	41.43	9.93	73.9	125	PASSED
22972.1	55.36	586.341	40.22	15.15	18.6	74	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11489.9	50.31	327.869	37.46	12.85	3.7	54	PASSED
17229.3	38.37	82.909	28.44	9.93	---	---	PASSED
22972.1	42.67	136.003	27.53	15.15	11.3	54	PASSED

Channel 157 / 5785MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11569.7	56.35	657.128	43.82	12.53	17.6	74	PASSED
17356.1	50.86	349.1	41.44	9.43	74.4	125	PASSED
23143	56.92	701.617	41.85	15.07	---	---	PASSED

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
30.03	20.9	11.094	24.94	-4.04	19.1	40	PASSED
38.4	23.29	14.607	32.83	-9.54	16.7	40	PASSED
906.329	23.39	14.776	27.48	-4.09	22.6	46	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11569.7	45.49	188.148	32.96	12.53	8.5	54	PASSED
17356.1	37.26	72.979	27.84	9.43	---	---	PASSED
23143	44.3	164.021	29.23	15.07	---	---	PASSED

Channel 165 / 5825MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11649.9	58.51	842.461	46.42	12.09	15.5	74	PASSED
17442	50.96	353.061	41.3	9.66	74.3	125	PASSED
23303	57.14	719.449	42.27	14.87	---	---	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11649.9	50.95	352.696	38.86	12.09	3	54	PASSED
17442	37.81	77.741	28.15	9.66	---	---	PASSED
23303	44.12	160.694	29.25	14.87	---	---	PASSED

8.4.3 802.11n, BPSK modulation, 13.5 / 15.0 Mbps data rate.

Channel 149+153 / 5755MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11509.8	57.15	720.112	44.21	12.94	16.8	74	PASSED
17266.3	50.43	332.315	40.61	9.82	74.8	125	PASSED
23020	55.92	625.245	41.02	14.91	18.1	74	PASSED

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
30.69	20.31	10.357	24.78	-4.47	19.7	40	PASSED
463.039	16.3	6.531	26.65	-10.35	29.7	46	PASSED
479.982	17.64	7.624	27.6	-9.96	28.4	46	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11509.8	45.6	190.568	32.66	12.94	8.4	54	PASSED
17266.3	37.79	77.491	27.97	9.82	---	---	PASSED
23020	42.67	135.941	27.77	14.91	11.3	54	PASSED

Channel 157+161 / 5795MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11589.7	57.78	774.016	45.46	12.32	16.2	74	PASSED
17384.6	50.06	318.237	40.49	9.57	75.2	125	PASSED
23165.1	56.6	676.161	41.57	15.03	---	---	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11589.7	49.39	294.747	37.07	12.32	4.6	54	PASSED
17384.6	37.45	74.585	27.88	9.57	---	---	PASSED
23165.1	43.53	150.072	28.5	15.03	---	---	PASSED

8.4.4 802.11n, 16QAM modulation, 81.0 / 90.0 Mbps data rate.

Channel 149+153 / 5755MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11510.2	57.43	743.447	44.49	12.94	16.6	74	PASSED
11510.322	56.64	678.813	43.7	12.94	17.3	74	PASSED
17261.7	51	354.773	41.16	9.84	74.2	125	PASSED
23016.9	55.62	604.157	40.75	14.87	18.4	74	PASSED

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
30.18	20.56	10.66	24.7	-4.14	19.4	40	PASSED
33.986	18.56	8.467	25.19	-6.63	21.4	40	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11510.2	46.01	199.802	33.07	12.94	8	54	PASSED
11510.322	44.8	173.68	31.86	12.94	9.2	54	PASSED
17261.7	37.88	78.343	28.04	9.84	---	---	PASSED
23016.9	42.54	133.906	27.67	14.87	11.4	54	PASSED

Channel 157+161 / 5795MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11590.4	57.21	725.437	44.9	12.31	16.8	74	PASSED
17388.9	50.72	343.677	41.15	9.57	74.5	125	PASSED
23165.3	56.74	687.068	41.71	15.03	---	---	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Margin	Limit [dBμV/m]	Results
11590.4	48.46	264.972	36.15	12.31	5.5	54	PASSED
17388.9	37.47	74.739	27.9	9.57	---	---	PASSED
23165.3	43.63	151.792	28.6	15.03	---	---	PASSED

9. Test Equipment

9.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1759	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
1916	Communication Tester	CMTA84	R&S	15B
1992	Signal Generator	83630B	Agilent	15C, 15B
1999	Receiver	ESIB26	R&S	22/24/27, 15C, 15B
2039	Power Supply	PL330QMD	Thurlby	15C, 15B
2059	V-network	ESH3-Z6	R&S	-
2097	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
2156	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2180	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2206	Signal Generator	SMX	R&S	15C, 15B
2347	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2352	Spectrum Analyzer	FSP-30	R&S	22/24/27, 15C
2359	Temperature Test Chamber	VT4002	Vötsch	22/24/27
2388	Bluetooth Tester	CBT	R&S	15B
2389	Signal Generator	SMJ 100A	R&S	15B
2390	Directional Coupler	DC2600	AR	-
6009	GPS Antenna	SA-700	Chronos	15C
6010	GPS Network amplifier	NLA20FPDC	GPS Networking, Inc	15C
6011	GPS signal Splitter	LDCBS1x4	GPS Networking, Inc	15C
6012	CDN	CDN USB/c	Teseq	-
6015	Receiver	ESI	R&S	22/24, 15C, 15B
6036	Data Logger	175-H2	Testo	22/24/27, 15C, 15B
6038	Data Logger	Testo 580	Testo	22/24/27, 15C, 15B
6039	USB Interface	5541765	Testo	22/24/27, 15C, 15B
6044	V-network	ESH3-Z6	R&S	-
6045	Power splitter	11667B	Agilent	22/24/27, 15C
6046	Attenuator 10dB	8493C	Agilent	22/24/27, 15C
6047	Attenuator 20dB	8493C	Agilent	22/24/27, 15C
6094	Communication Tester	CMW500	R&S	22/24/27, 15C, 15B
6096	EMC Analyzer	E7405A	HP	-
6098	Signal Generator	8648C	Agilent	-
6103	Bluetooth tester	CBT	R&S	15B
6113	Signal Generator	SMF100A	R&S	22/24/27, 15C 15B
6120	Thermal Chamber	WT 20/40	Weiss	22/24/27, 15C 15B
6121	Power Splitter	HP11667B	Agilent	22/24/27, 15C 15B
6122	Power Splitter	HP11667B	Agilent	22/24/27, 15C 15B
6134	Attenuator 10dB	BW-S10-2W263+	Mini-Circuits	22/24/27, 15C
6136	Attenuator 20dB	BW-S20-2W263+	Mini-Circuits	22/24/27, 15C
10479	Communication Tester	CMW500	R&S	22/24/27, 15C, 15B
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B

9.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1917	Communication Tester	CMTA84	R&S	15B
1984	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C, 15B
2009	Signal Generator	SMP 22	R&S	22/24/27, 15C, 15B
2027	CDN	M2 (modified) DC1	MEB	22/24/27, 15C, 15B
2028	CDN	M3 (modified) DC2	MEB	22/24/27, 15C, 15B

Eq. No	Equipment	Type	Manufacturer	Used in
2029	Power Supply	PL330	Thurlby	22/24/27, 15C
2043	Band Reject Filter	WRCA824/849-0,2-6SS	Wainwright	22
2135	CDN	CDN 801-M3	Lüthi	22/24/27, 15C, 15B
2140	Antenna	EMCO93110B	EMCO	22/24/27, 15C
2142	Antenna	3146	EMCO	22/24/27, 15C
2156	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2176	CDN	CDN 801-M3	Lüthi	22/24/27, 15C, 15B
2180	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2347	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2353	Receiver	ESIB26	R&S	22/24/27, 15C, 15B
2357	Band Reject Filter	WRCG2400/2483-2390/2493-35/10SS	Wainwright	15C
2361	Anechoic Chamber	3 m Semi / Full Anechoic Chamber	Euroshield	22/24/27, 15C, 15B
2364	Band Reject Filter	WRCG1877/1883 - 1870/1890-40/6SS	Wainwright	24
2384	Band Reject Filter	WRCG832/838-825/845-40/5SS	Wainwright	22
2388	Bluetooth Tester	CBT	R&S	15B
2389	Signal Generator	SMJ 100A	R&S	15B
2391	Band Reject Filter	WRCG1729.4/1735.4-1722.4/1742.4-40/6SS	Wainwright	27
6009	GPS Antenna	SA-700	Chronos	15C
6010	GPS Network amplifier	NLA20FPDC	GPS Networking, Inc	15C
6011	GPS signal Splitter	LDCBS1x4	GPS Networking, Inc	15C
6014	Substitute Calibration Cable	Sucoflex 104PB	Suhner	-
6017	Antenna	SBA 9113	Schwarzbeck	22 / 24 / 27
6037	Data Logger	175-H2	Testo	22/24/27, 15C, 15B
6038	Data Logger	Testo 580	Testo	22/24/27, 15C, 15B
6039	USB Interface	5541765	Testo	22/24/27, 15C, 15B
6087	Antenna	BBHA 9120D	Scharzbeck	22/24/27, 15C
6088	Antenna	VUBA 9117	Scharzbeck	22/24/27, 15C
6089	Antenna	HFH2-Z2	R&S	15C, 15B
6094	Communication Tester	CMW500	R&S	22/24/27, 15C, 15B
6103	Bluetooth tester	CBT	R&S	15B
6113	Signal Generator	SMF100A	R&S	22/24/27, 15C 15B
6115	Open switch and control unit	OSP 130	R&S	22/24/27, 15C 15B
6116	Open switch and control unit	OSP 150	R&S	22/24/27, 15C 15B
6130	Notch Filter	WRCD1880-1.1.25/50-10SS	Wainwright	22/24/27
6131	Notch Filter	WRCT902.4-0.4/40-8SS	Wainwright	-
6135	Notch Filter	WRCJV2531/2539-2523/2547-60/12SS	Wainwright	22/24/27
10479	Communication Tester	CMW500	R&S	22/24/27, 15C, 15B
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	RF immunity / Emission Software	EMC32	R&S	22/24/27, 15C, 15B