FCC Part 15C Compliance Test Report

Test Report no.:	FCC15CWLAN_RM-985_15.docx	**Date of Report:**	30-Jul-2014
Number of pages:	73	**Customer's Contact person:**	Victoria Abadilla
Testing laboratory:	TCC Microsoft Tampere Laboratory P.O. Box 403 Visiokatu 3 FIN-33101 TAMPERE, FINLAND Tel. +358 71 800 8000 Fax. +358 71 804 6880	**Customer:**	Microsoft 16620 West Bernardo Drive San Diego, CA 92127 USA Tel. +1 858 831 5000 Fax. +1 858 385 1598
FCC listing no.: **IC recognition no.:**	94436 661AK-1		
Tested devices/ accessories:	**Phone RM-985 / Battery BV-L4A / AC charger AC-60E / Data cable CA-190CD / Headset WH-208**		
FCC ID:	QMNRM-985	**IC:**	661X-RM985
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, RSS-210 (Issue 8, December 2010). 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:			

Sami Lehtonen, Specialist, EMC

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1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	25-Jun-2014
Testing completed	02-Jul-2014
The customer's contact person	Victoria Abadilla
Test Plan referred to	T:\Projects\RM-984\TestPlan\RS_testplan_RM-984.xlsm
Notes	-
Document name	T:\Projects\RM-985\EMC\FCC15CWLAN_RM-985_15.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-984	004402478222346	0200	-	02028.00000.14224.06001	43184
Phone	RM-984	004402478222536	0200	-	02028.00000.14224.06001	43187
Battery	BV-L4A	4181574243S11400031;0670727	3.0	1.0	-	43185
Battery	BV-L4A	4181574243S11400027;0670727	3.0	1.0	-	43188
Headset	WH-208	-	-	-	-	43186
AC charger	AC-60E	40909311658030024 2;0677566	-	-	-	43074
Data Cable	CA-190CD	-	-	-	-	43034

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)	A8.4(4)	Conducted peak output power	PASSED
15.247(d), 15.205(b)	A8.5	Band edge compliance of RF emissions	PASSED
15.247(d)	A8.5	Spurious RF conducted emissions	PASSED
15.247(d), 15.209	A8.5	Spurious radiated emissions	PASSED
15.207	7.2.2	AC powerline conducted emissions	NP
15.247(a)(2)	A8.2(a)	6dB(bandwidth)	PASSED
15.247(e)	A8.2(b)	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 Microsoft Laboratory.
The test results of QMNRM-984 *are re-used for certification of the* QMNRM-985*. The table above indicates the results, which will be re-used.*

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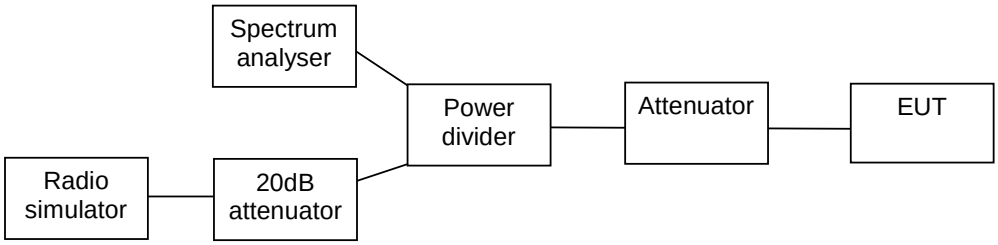
2. Conducted peak output power
(FCC §15.247(b)(1), RSS-210 A8.4(4))

EUT with DUT number	RM-984, DUT 43187
Accessories with DUT numbers	BV-L4A, DUT 43188
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20-24 / 42-49 / 98.1-99.2
Date of measurements	26-Jun.. 02-Jul-2014
Measured by	Jari Jantunen

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

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2.3. Power results summary

Channel / f_C [MHz]	Mode	Modulation	Data rate	Level [dBm]
1 / 2412	802.11g	BPSK	6 Mbps	21.36
6 / 2437	802.11g	BPSK	6 Mbps	23.52
11 / 2462	802.11g	BPSK	6 Mbps	23.48
1 / 2412	802.11g	64QAM	54 Mbps	21.59
6 / 2437	802.11g	64QAM	54 Mbps	22.11
11 / 2462	802.11g	64QAM	54 Mbps	22.06
149 / 5745	802.11n	BPSK	6.5 / 7.25 Mbps	23.00
157 / 5785	802.11n	BPSK	6.5 / 7.25 Mbps	22.83
165 / 5825	802.11n	BPSK	6.5 / 7.25 Mbps	22.89
149 / 5745	802.11n	QPSK	19.5 / 21.7 Mbps	22.23
157 / 5785	802.11n	QPSK	19.5 / 21.7 Mbps	22.12
165 / 5825	802.11n	QPSK	19.5 / 21.7 Mbps	21.99
149+153 / 5755	802.11n	BPSK	13.5 / 15.0 Mbps	20.69
157+161 / 5795	802.11n	BPSK	13.5 / 15.0 Mbps	20.87
149+153 / 5755	802.11n	QPSK	27.0 / 30.0 Mbps	20.59
157+161 / 5795	802.11n	QPSK	27.0 / 30.0 Mbps	20.48

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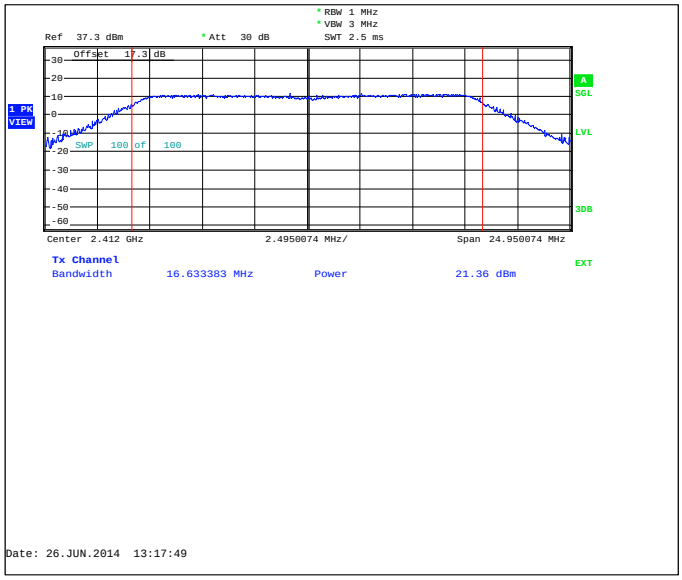
2.4. WLAN Test results

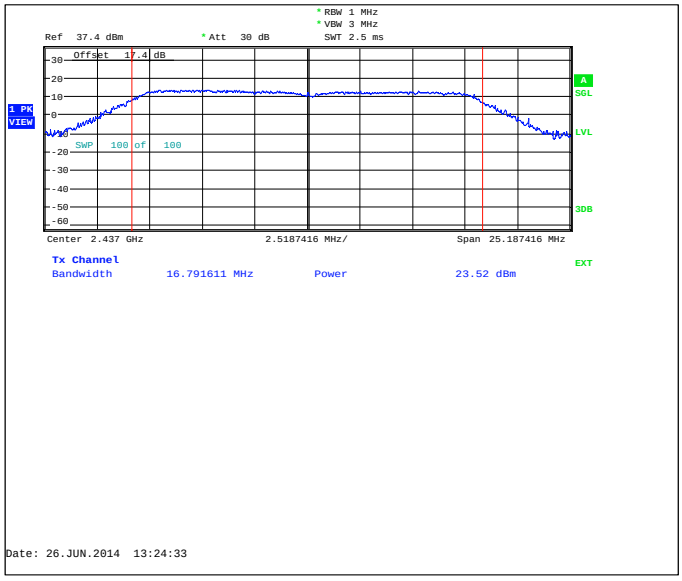
2.4.1 802.11g mode, BPSK modulation, 6 Mbps data rate

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
1 / 2412	21.36	136.773	PASSED
6 / 2437	23.52	224.905	PASSED
11 / 2462	23.48	222.844	PASSED

Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



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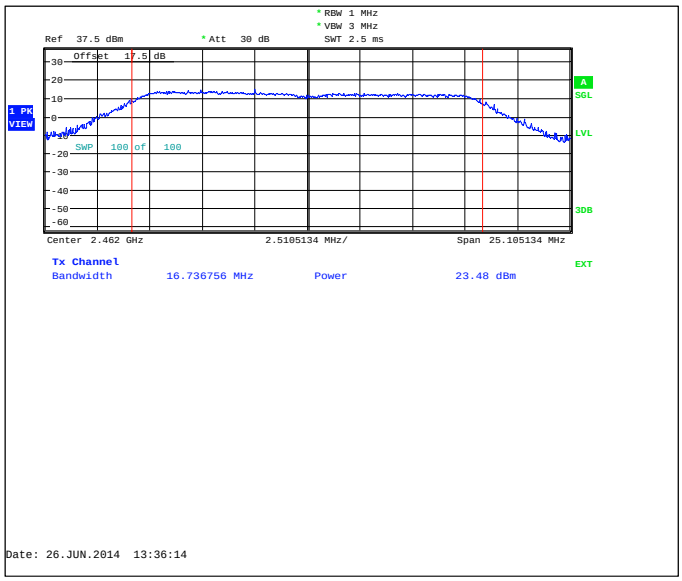
Channel 11 / 2462 MHz



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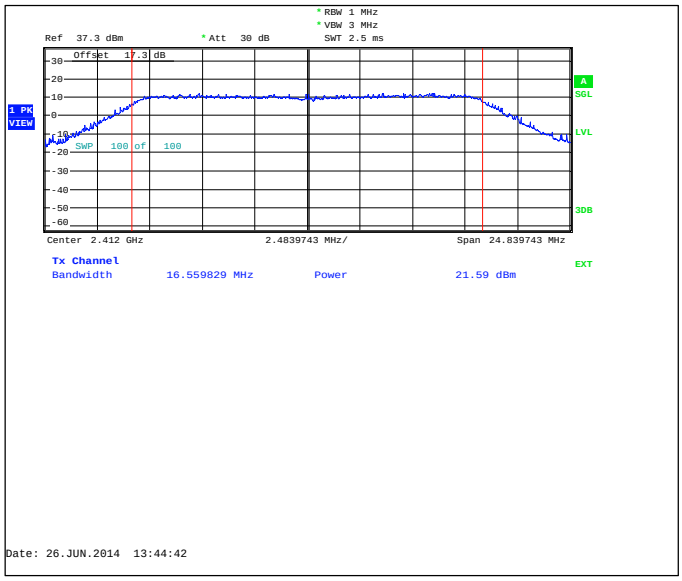
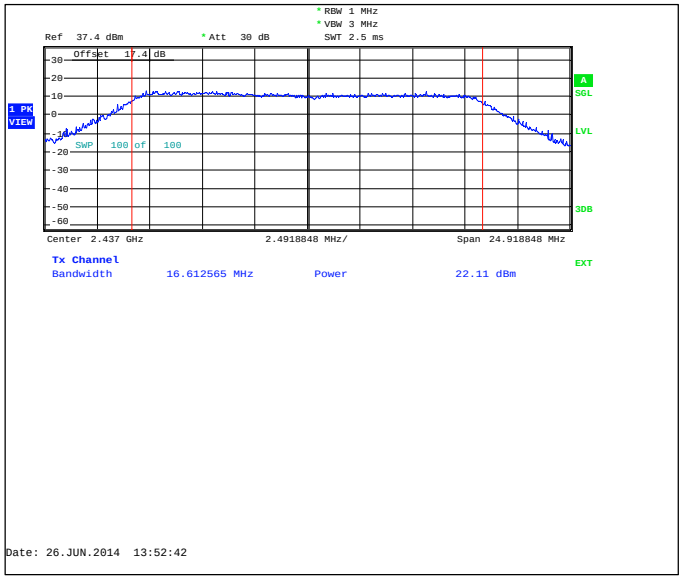
2.4.2 802.11g mode, 64QAM modulation, 54 Mbps data rate

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
1 / 2412	21.59	144.212	PASSED
6 / 2437	22.11	162.555	PASSED
11 / 2462	22.06	160.694	PASSED

Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



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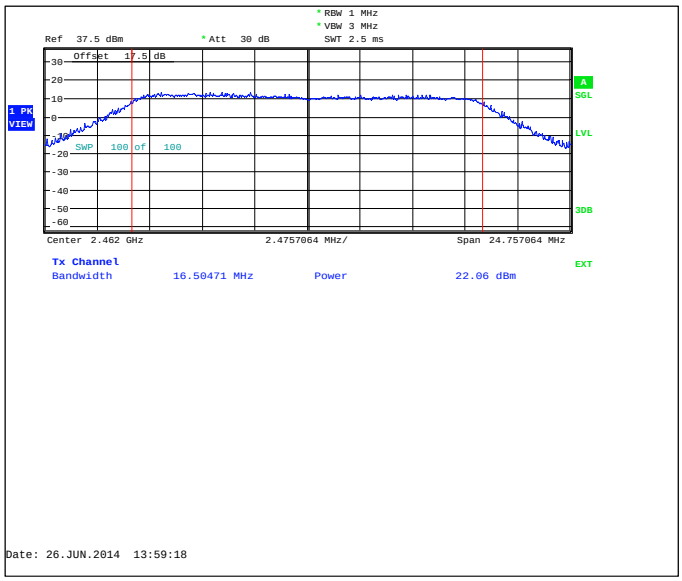
Channel 11 / 2462 MHz



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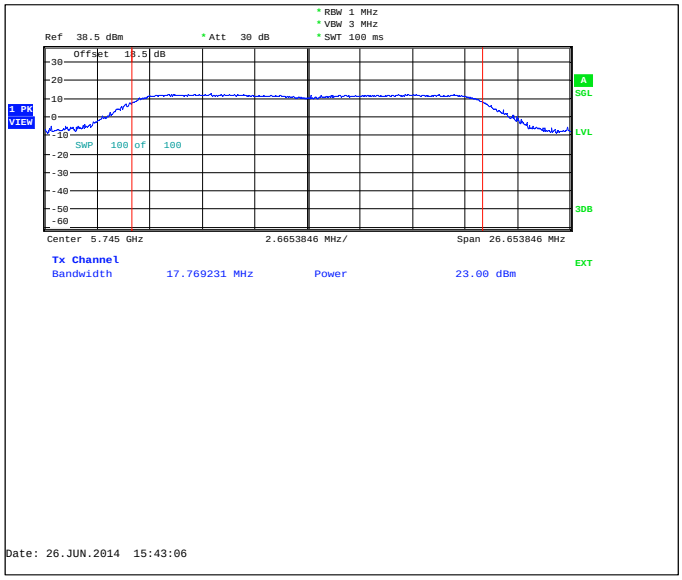
2.5. 5 GHz RLAN Test results

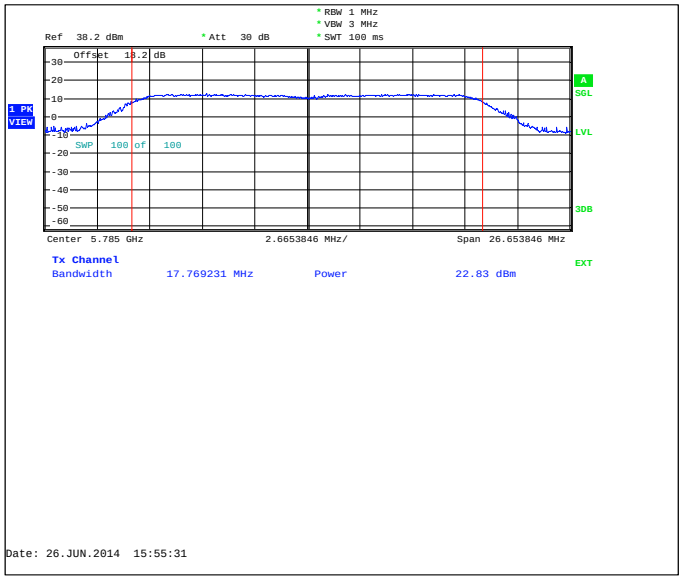
2.5.1 802.11n mode, BPSK modulation, 6.5 / 7.25 Mbps data rate

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
149 / 5745	23.00	199.526	PASSED
157 / 5785	22.83	191.867	PASSED
165 / 5825	22.89	194.536	PASSED

Channel 149 / 5745MHz



Channel 157 / 5785MHz



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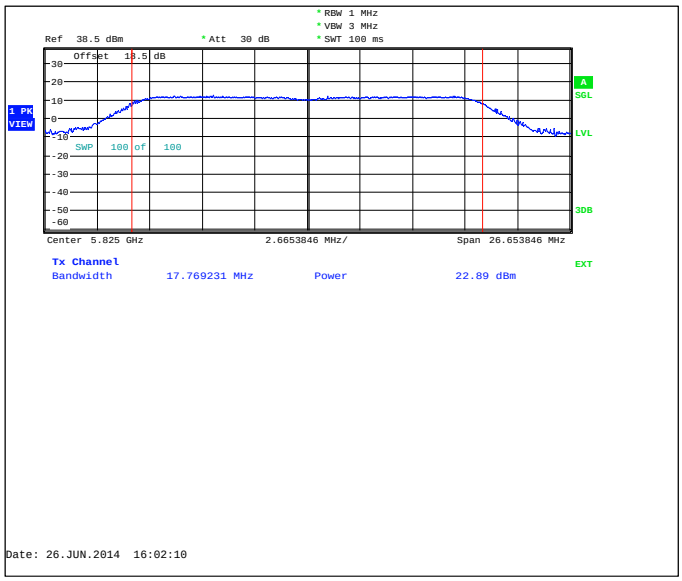
Channel 165 / 5825MHz



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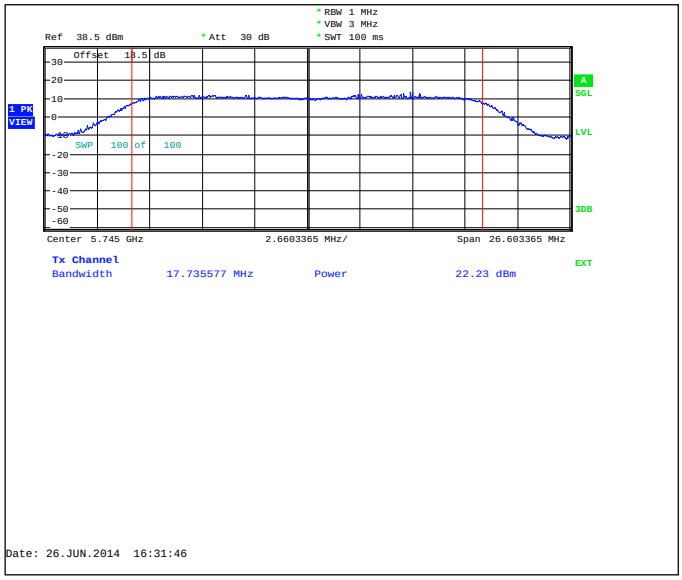
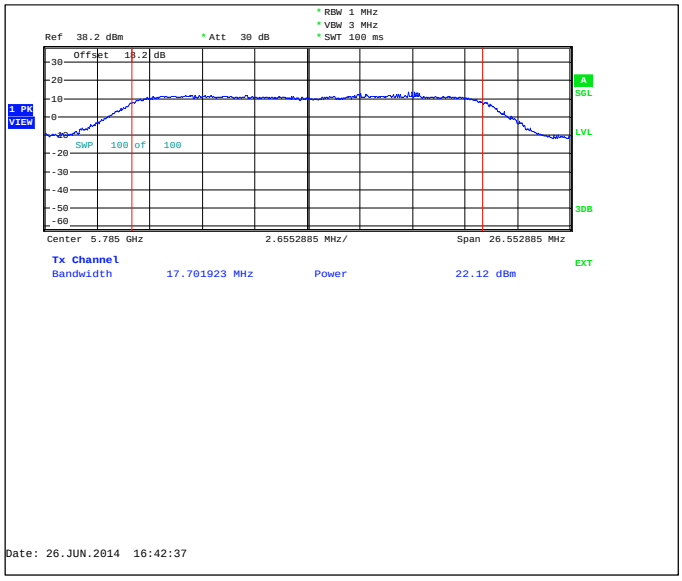
2.5.2 802.11n mode, QPSK modulation, 19.5 / 21.7 Mbps data rate

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
149 / 5745	22.23	167.109	PASSED
157 / 5785	22.12	162.93	PASSED
165 / 5825	21.99	158.125	PASSED

Channel 149 / 5745MHz



Channel 157 / 5785MHz



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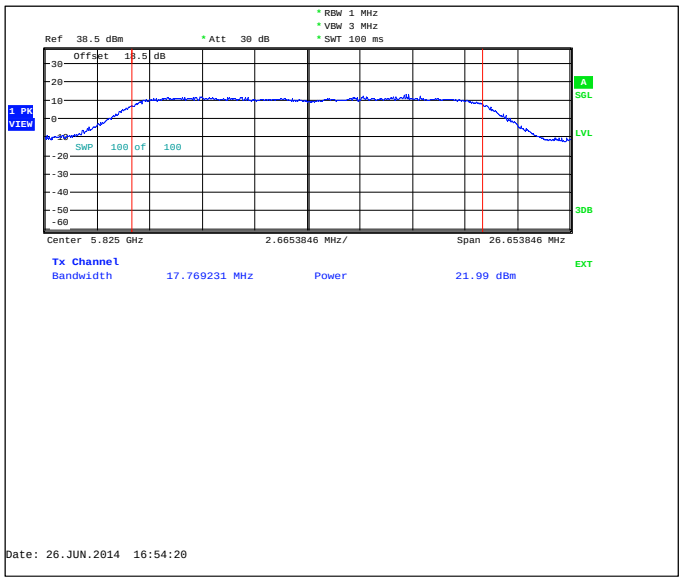
Channel 165 / 5825MHz



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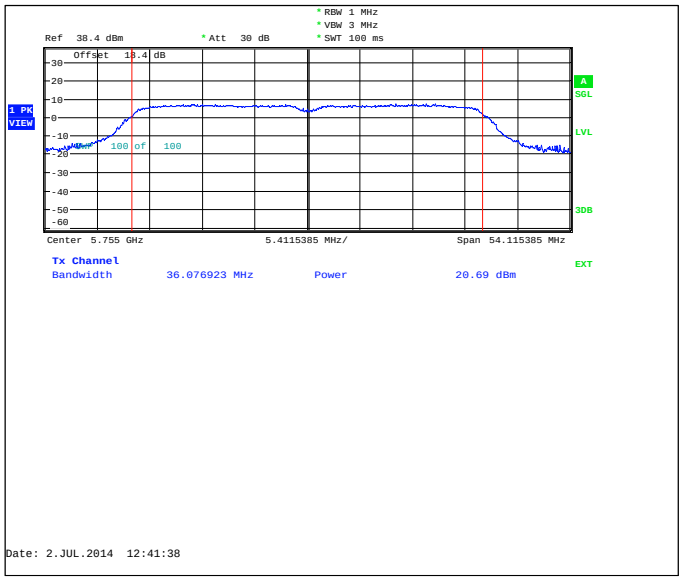
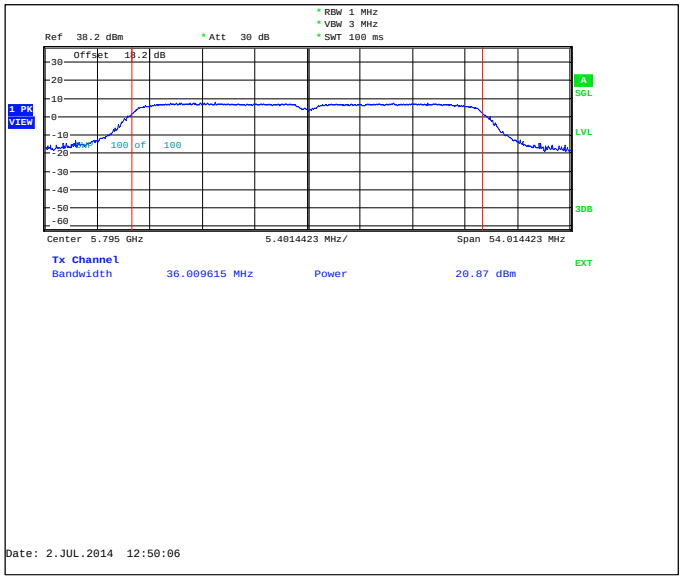
2.5.3 802.11n mode, BPSK modulation, 13.5 / 15.0 Mbps data rate

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
149+153 / 5755	20.69	117.22	PASSED
157+161 / 5795	20.87	122.18	PASSED

Channel 149+153 / 5755MHz



Channel 157+161 / 5795MHz



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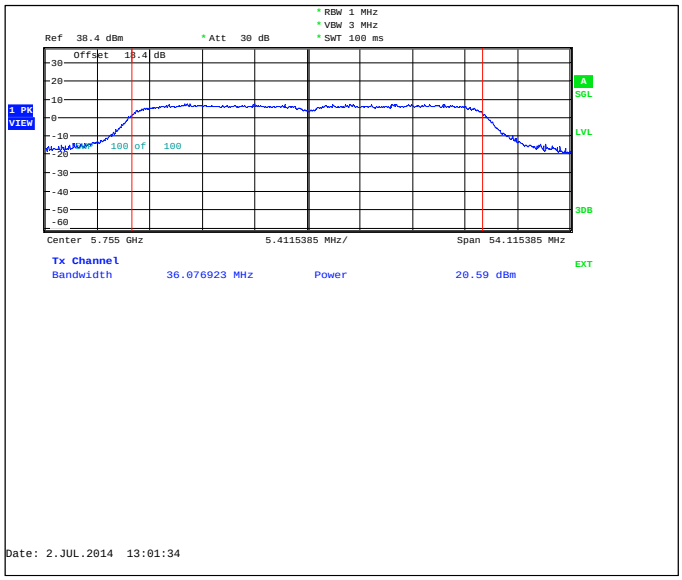
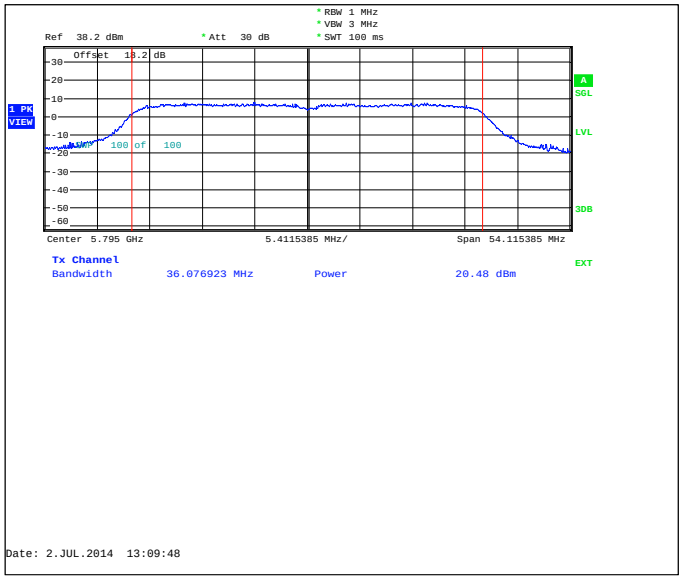
2.5.4 802.11n mode, QPSK modulation, 27.0 / 30.0 Mbps data rate

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
149+153 / 5755	20.59	114.551	PASSED
157+161 / 5795	20.48	111.686	PASSED

Channel 149+153 / 5755MHz



Channel 157+161 / 5795MHz



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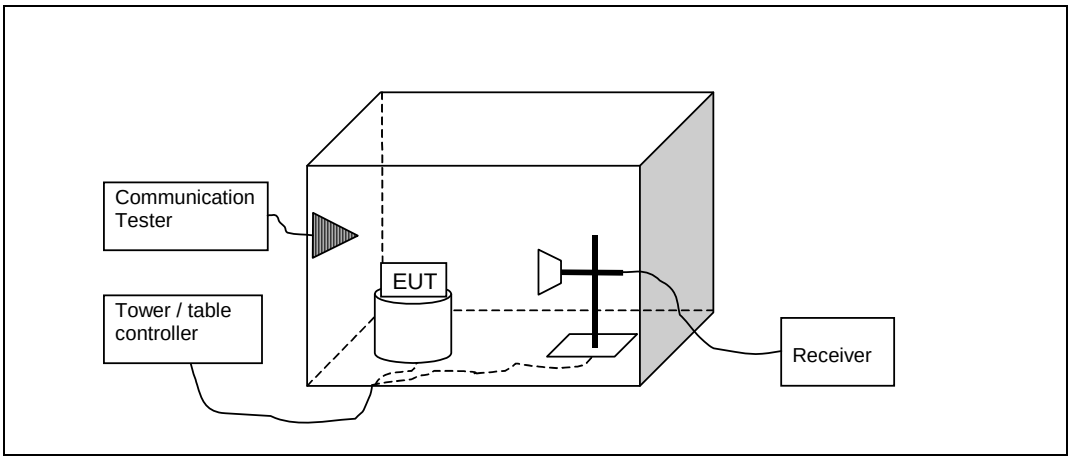
3. Band edge compliance of RF emissions
(FCC 15.247(d), 15.205(b), RSS-210 A8.5)

EUT with DUT number	RM-984, DUT 43184
Accessories with DUT numbers	BV-L4A, DUT 43185 ; WH-208, DUT 43186 ; AC-60E, DUT 43074 ; CA-190CD, DUT 43034
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [ºC] / Humidity [%RH] / Air Pressure [kPa]	25 / 36 / 98.0
Date of measurements	27-Jun-2014
Measured by	Jari Jantunen

3.1.1 Test setup



3.2. Test method and limit

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

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)

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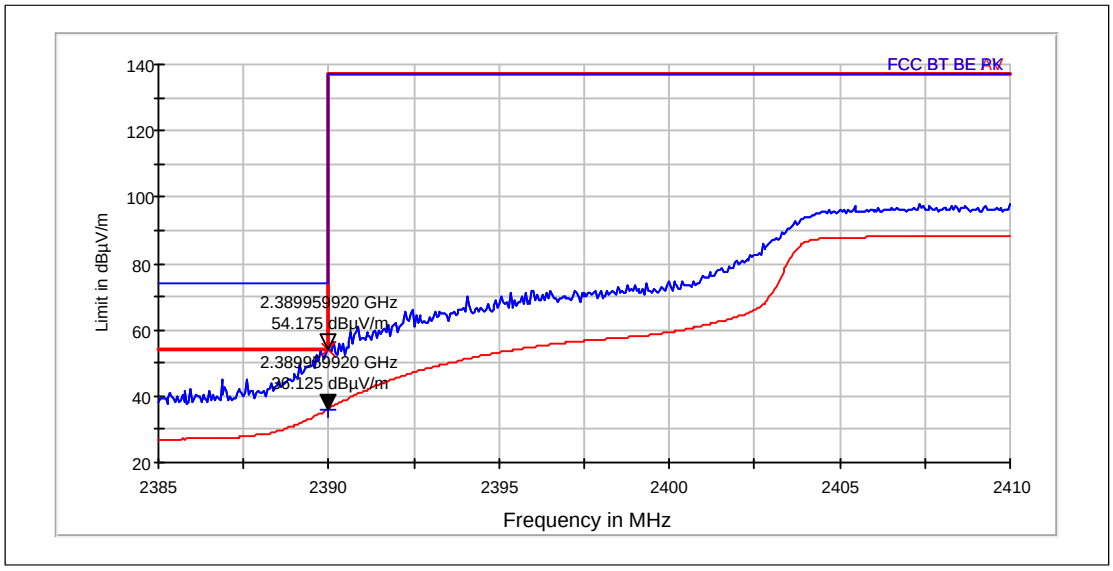
3.3. WLAN test results

3.3.1 802.11g, 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]	Results
2390	54.18	511.387	66.39	-12.21	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2390	36.13	64.01	48.34	-12.21	PASSED

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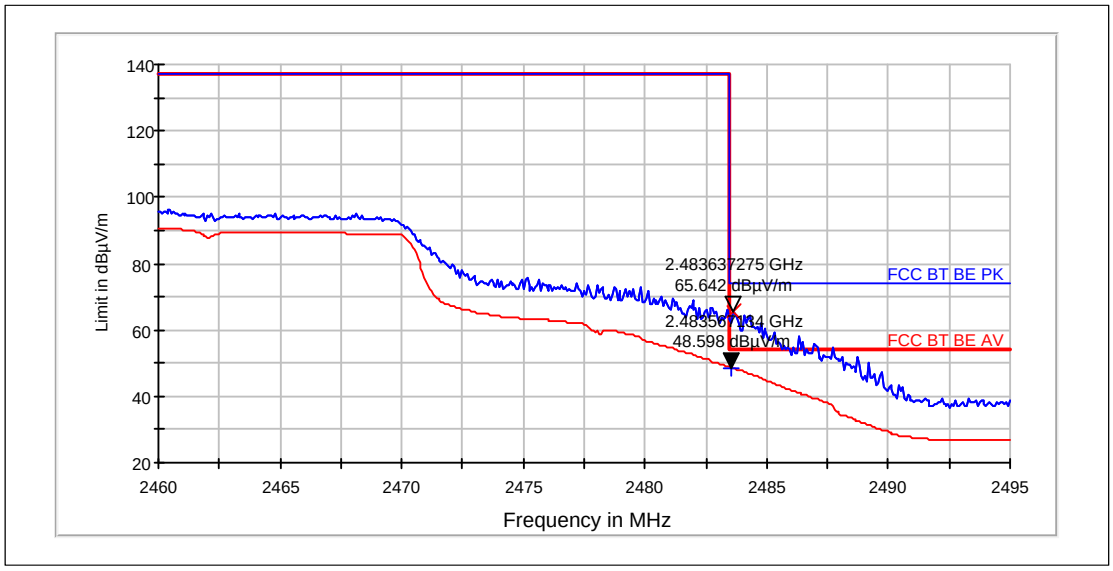
Channel 11 / 2462 MHz



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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2484	65.64	1914.697	77.82	-12.18	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2484	48.6	269.092	60.78	-12.18	PASSED

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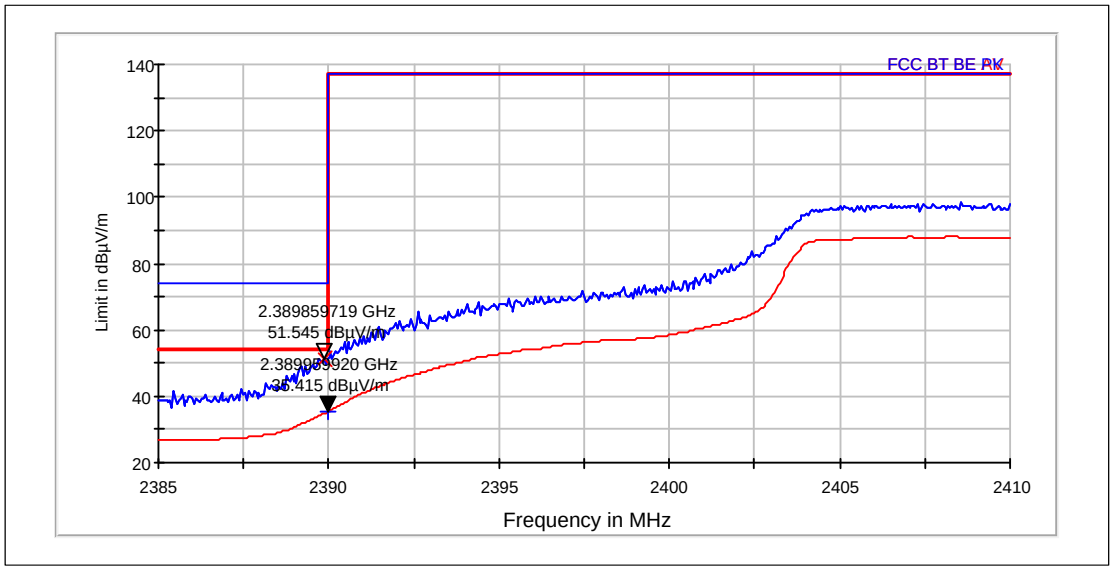
3.3.2 802.11g, 64QAM modulation, 54 Mbps data rate.

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]	Results
2390	51.55	377.79	63.76	-12.21	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2390	35.42	58.986	47.63	-12.21	PASSED

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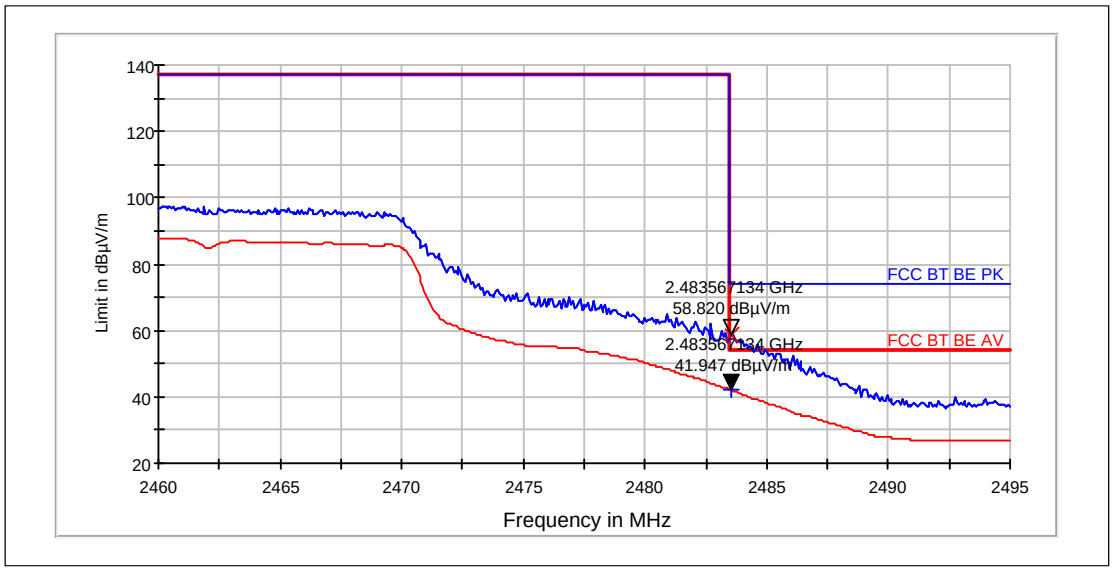
Channel 11 / 2462 MHz



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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2484	58.82	872.971	71	-12.18	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Results
2484	41.95	125.127	54.13	-12.18	PASSED

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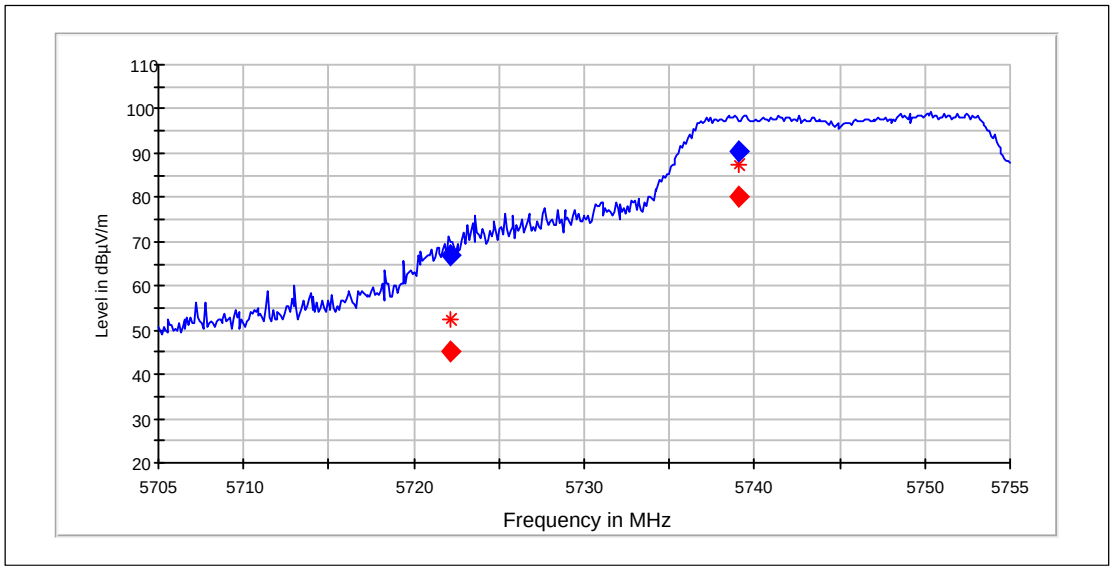
3.4. 5 GHz RLAN test results

3.4.1 802.11n, BPSK modulation, 6.5 / 7.25 Mbps data rate.

Channel 149 / 5745MHz



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

Frequency [MHz]	MaxPeak [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5722.154	66.77	200	133.23	170	V	6	0	PASSED
5739.048	90.27	200	109.73	170	H	5	0.5	PASSED

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

Frequency [MHz]	Average [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5722.154	45.14	---	---	170	V	6	0	PASSED
5739.048	80	---	---	170	H	5	0.5	PASSED

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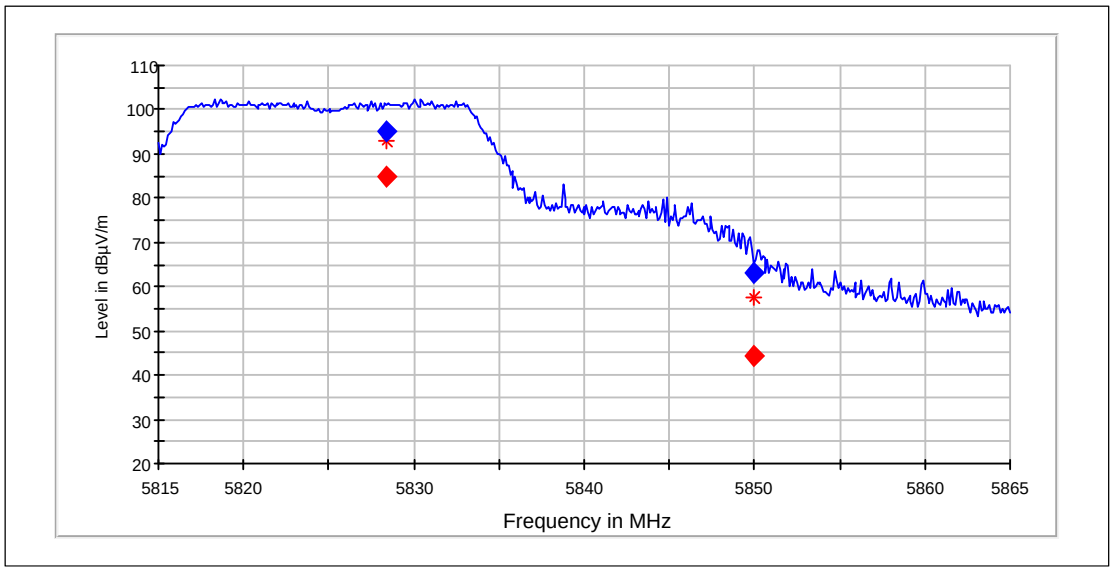
Channel 165 / 5825MHz



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

Frequency [MHz]	MaxPeak [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5828.427	95.07	200	104.93	170	V	7	0	PASSED
5850	63.27	200	136.73	170	V	11	0	PASSED

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

Frequency [MHz]	Average [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5828.427	84.79	---	---	170	V	7	0	PASSED
5850	44.1	---	---	170	V	11	0	PASSED

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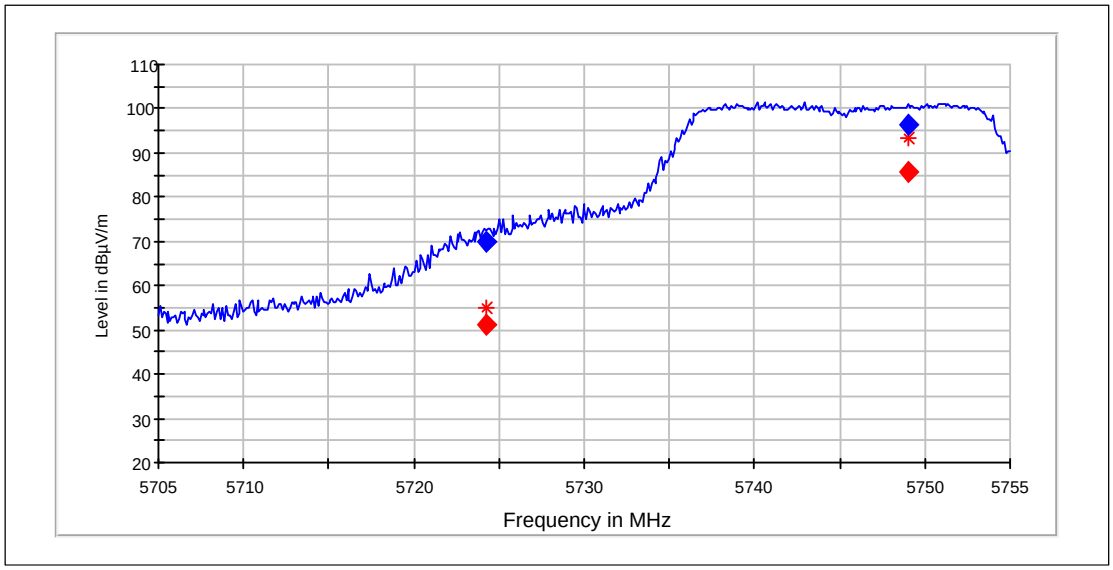
3.4.2 802.11n, QPSK modulation, 19.5 / 21.7 Mbps data rate.

Channel 149 / 5745MHz



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

Frequency [MHz]	MaxPeak [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5724.238	69.91	200	130.09	170	V	11	0.5	PASSED
5748.988	96.43	200	103.57	170	V	11	0	PASSED

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

Frequency [MHz]	Average [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5724.238	51.29	---	---	170	V	11	0.5	PASSED
5748.988	85.89	---	---	170	V	11	0	PASSED

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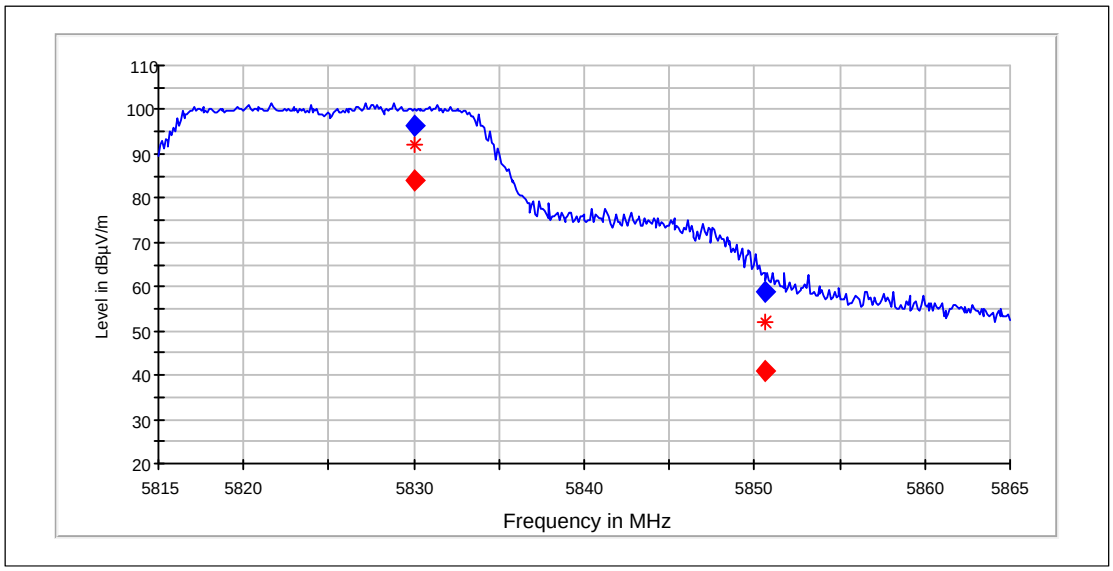
Channel 165 / 5825MHz



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

Frequency [MHz]	MaxPeak [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5830.03	96.43	200	103.57	170	V	8	0	PASSED
5850.661	58.63	200	141.37	170	V	9	0	PASSED

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

Frequency [MHz]	Average [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5830.03	84.05	---	---	170	V	8	0	PASSED
5850.661	40.81	---	---	170	V	9	0	PASSED

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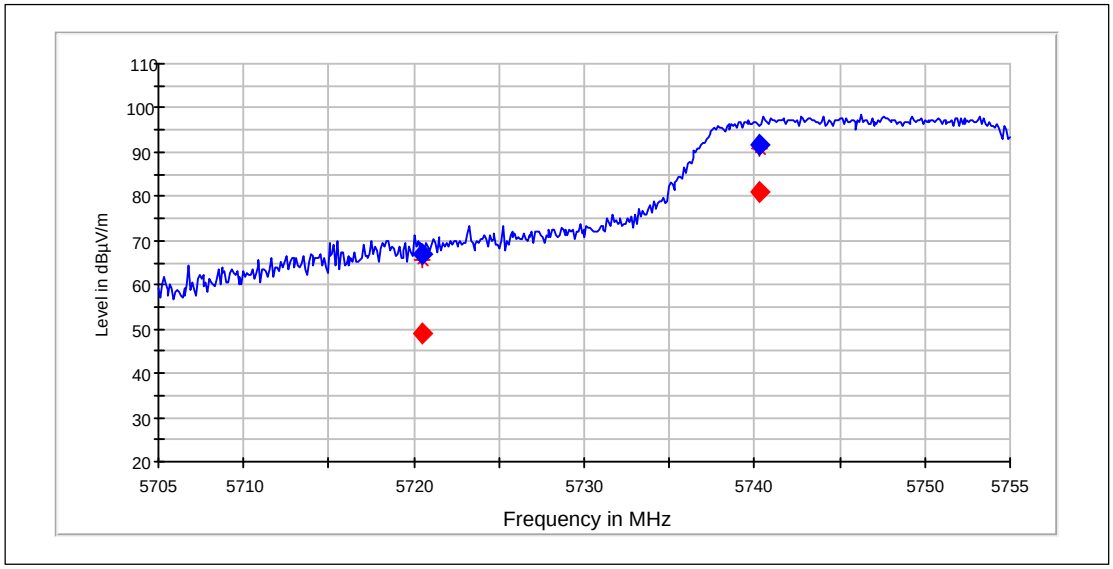
3.4.3 802.11n, BPSK modulation, 13.5 / 15 Mbps data rate.

Channel 149+153 / 5755MHz



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

Frequency [MHz]	MaxPeak [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5720.471	66.98	200	133.02	170	V	9	0	PASSED
5740.251	91.53	200	108.47	170	V	11	0	PASSED

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

Frequency [MHz]	Average [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5720.471	48.88	---	---	170	V	9	0	PASSED
5740.251	80.93	---	---	170	V	11	0	PASSED

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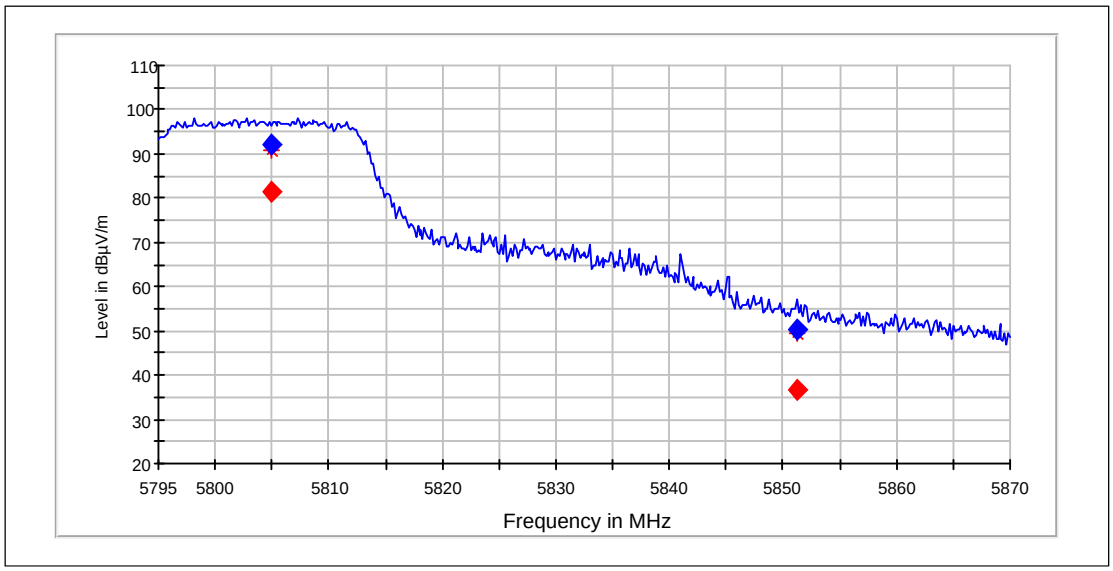
Channel 157+161 / 5795MHz



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

Frequency [MHz]	MaxPeak [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5804.9	92.24	200	107.76	170	V	11	0	PASSED
5851.202	50.36	200	149.64	170	V	-1	0	PASSED

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

Frequency [MHz]	Average [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5804.9	81.32	---	---	170	V	11	0	PASSED
5851.202	36.74	---	---	170	V	-1	0	PASSED

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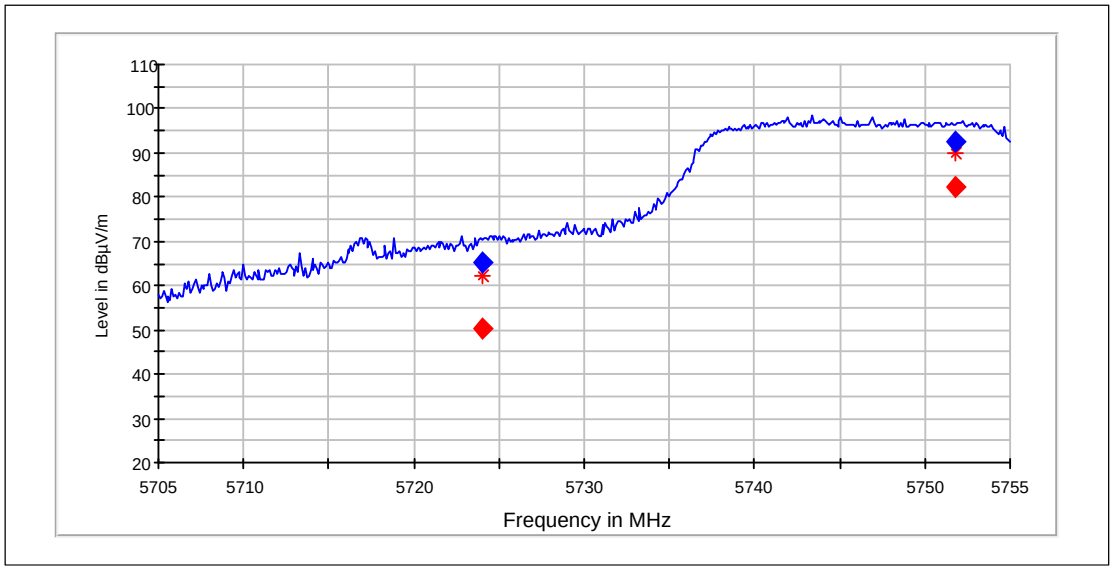
3.4.4 802.11n, QPSK modulation, 27.0 / 30 Mbps data rate.

Channel 149+153 / 5755MHz



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

Frequency [MHz]	MaxPeak [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5724.078	65.23	200	134.77	170	V	12	0.5	PASSED
5751.834	92.47	200	107.53	170	V	11	0	PASSED

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

Frequency [MHz]	Average [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5724.078	50.48	---	---	170	V	12	0.5	PASSED
5751.834	82.07	---	---	170	V	11	0	PASSED

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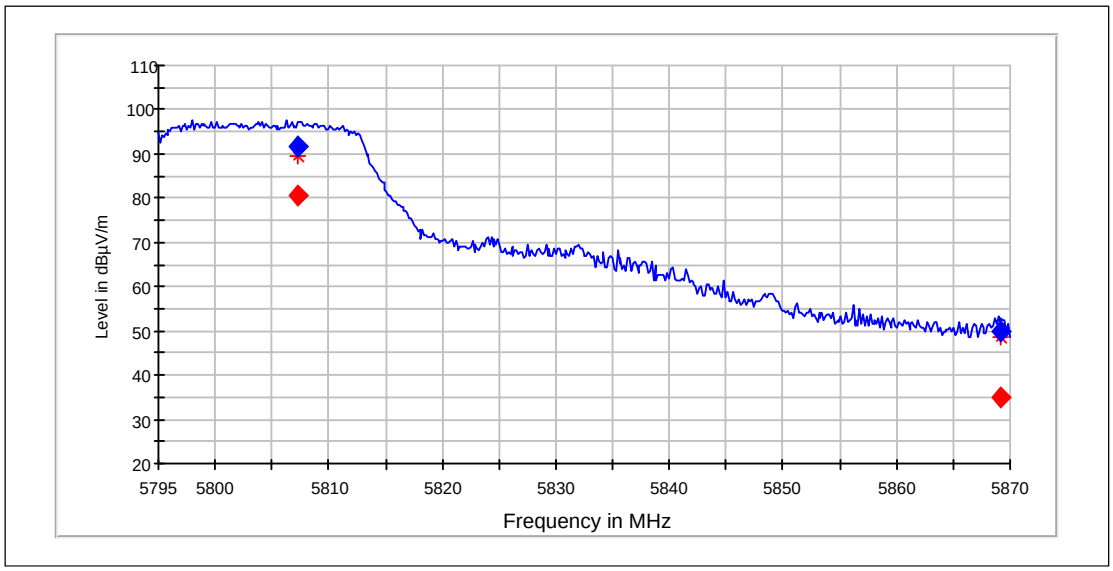
Channel 157+161 / 5795MHz



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

Frequency [MHz]	MaxPeak [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5807.265	91.56	200	108.44	170	V	11	0	PASSED
5869.238	49.81	200	150.19	170	V	14	0	PASSED

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

Frequency [MHz]	Average [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Pol	Azimuth [deg]	Elevation [deg]	Results
5807.265	80.65	---	---	170	V	11	0	PASSED
5869.238	34.95	---	---	170	V	14	0	PASSED

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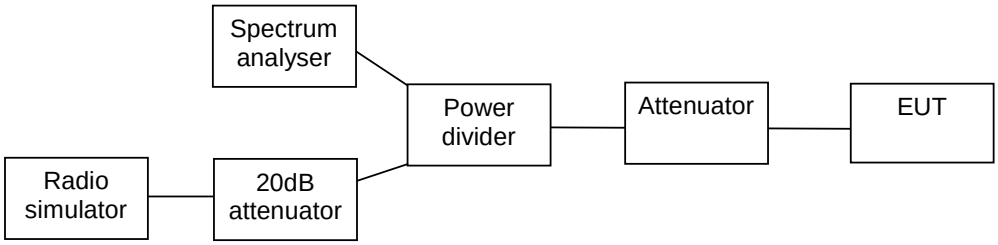
4. Spurious RF conducted emissions
(FCC §15.247(d), RSS-210 A8.5)

EUT with DUT number	RM-984, DUT 43187
Accessories with DUT numbers	BV-L4A, DUT 43188
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 45 / 98.1
Date of measurements	26-Jun-2014
Measured by	Jari Jantunen

4.1. Test Setup



4.2. 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 11.2 of the KDB 558074, using span of 1.5 times the OBW.

Limits for spurious RF conducted emissions measurements

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

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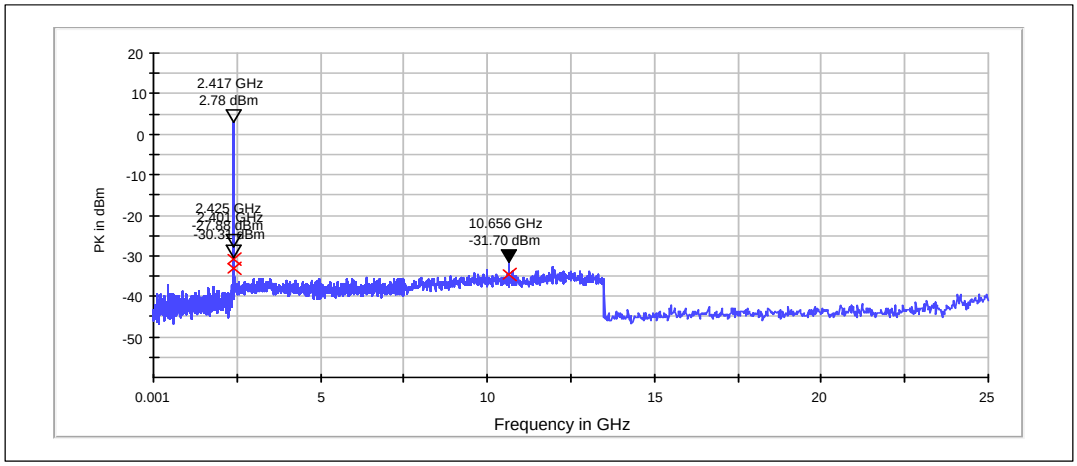
4.3. WLAN Test results

4.3.1 802.11g mode, BPSK modulation, 6 Mbps data rate

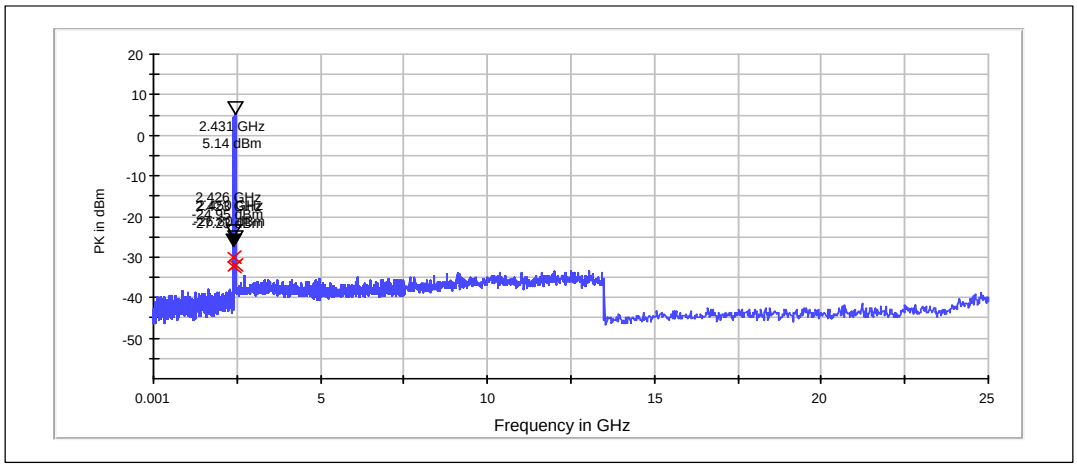
Channel 1 / 2412 MHz



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

Frequency [MHz]	P [dBc]	Result
2424.760	-30.66	PASSED
2401.192	-33.09	PASSED
10656.000	-34.48	PASSED

Channel 6 / 2437 MHz



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

Frequency [MHz]	P [dBc]	Result
2426.142	-30.09	PASSED
2449.710	-31.94	PASSED
2423.284	-32.37	PASSED

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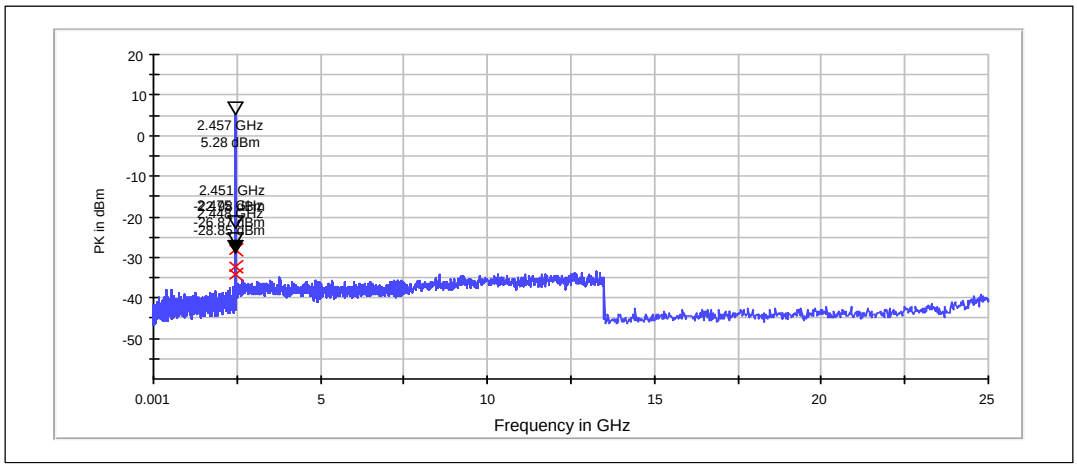
Channel 11 / 2462 MHz

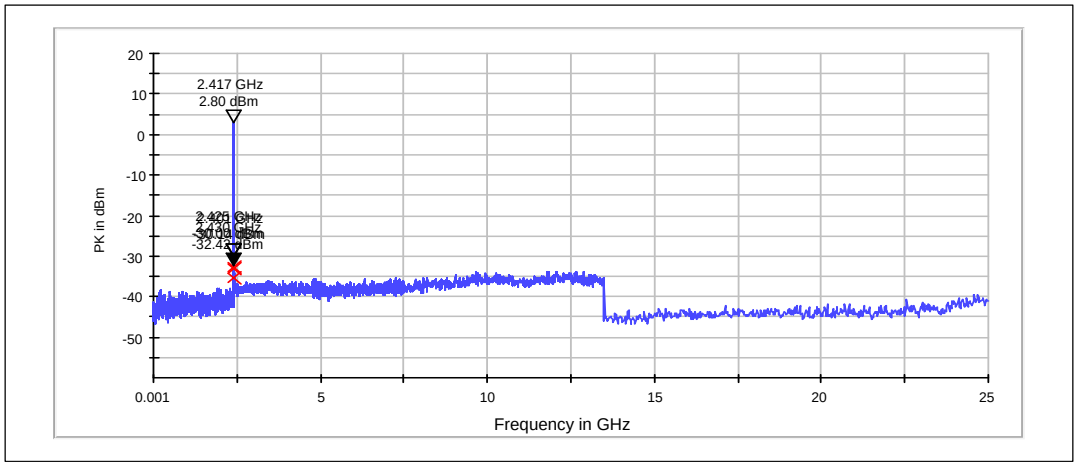


Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
2451.092	-28.26	PASSED
2474.660	-32.15	PASSED
2448.184	-34.13	PASSED

4.3.2 802.11g mode, 64QAM modulation, 54 Mbps data rate

Channel 1 / 2412 MHz



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

Frequency [MHz]	P [dBc]	Result
2424.760	-32.80	PASSED
2401.192	-32.94	PASSED
2429.520	-35.22	PASSED

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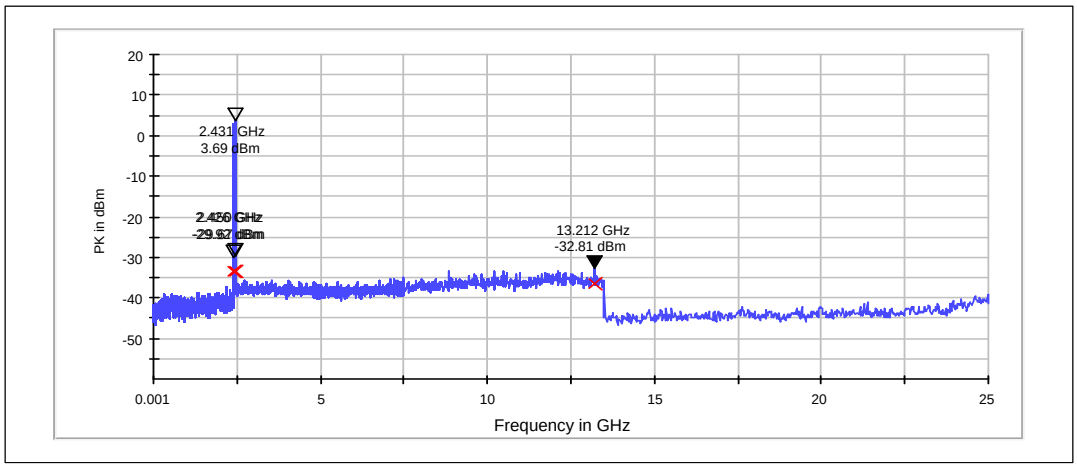
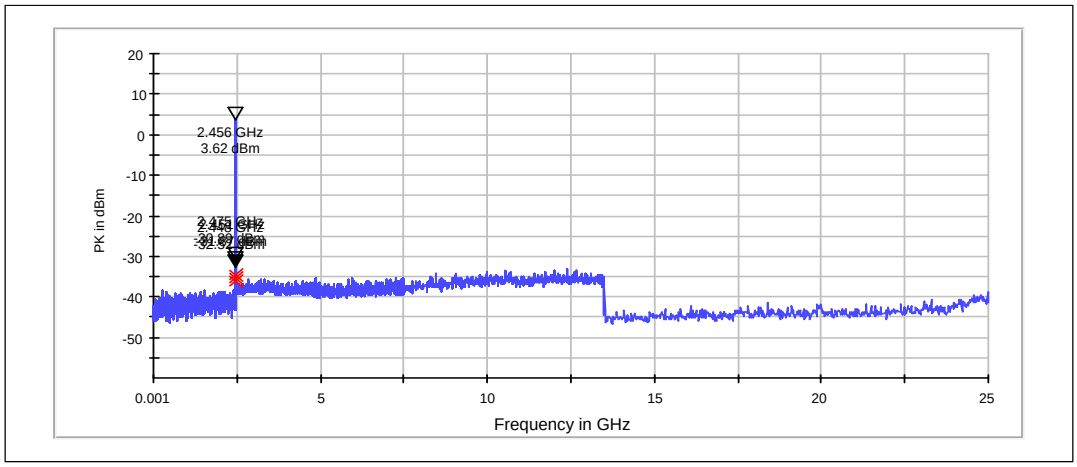
Channel 6 / 2437 MHz



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

Frequency [MHz]	P [dBc]	Result
2449.710	-33.36	PASSED
2426.142	-33.61	PASSED
13212.000	-36.50	PASSED

Channel 11 / 2462 MHz



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

Frequency [MHz]	P [dBc]	Result
2474.660	-34.52	PASSED
2451.092	-35.49	PASSED
2448.184	-36.14	PASSED

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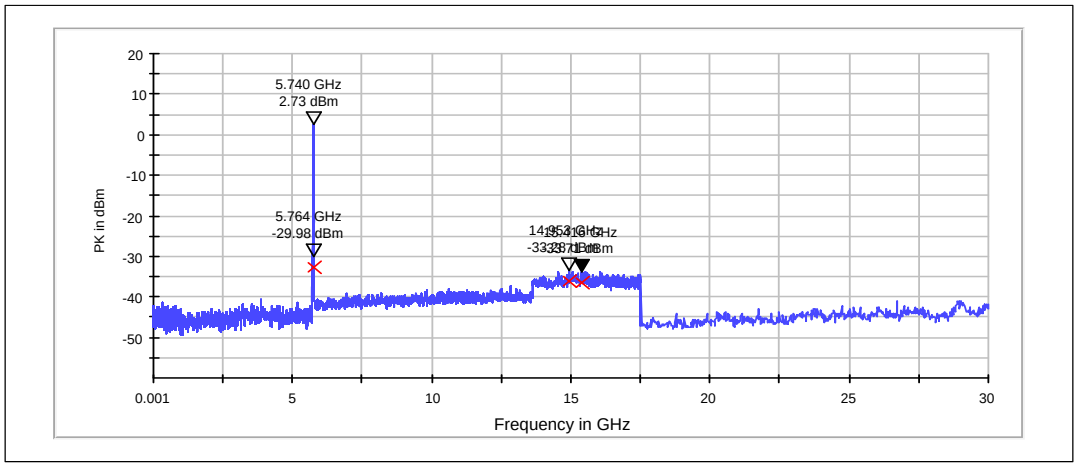
4.4. 5 GHz RLAN Test results

4.4.1 802.11n mode, BPSK modulation, 6.5 / 7.25 Mbps data rate

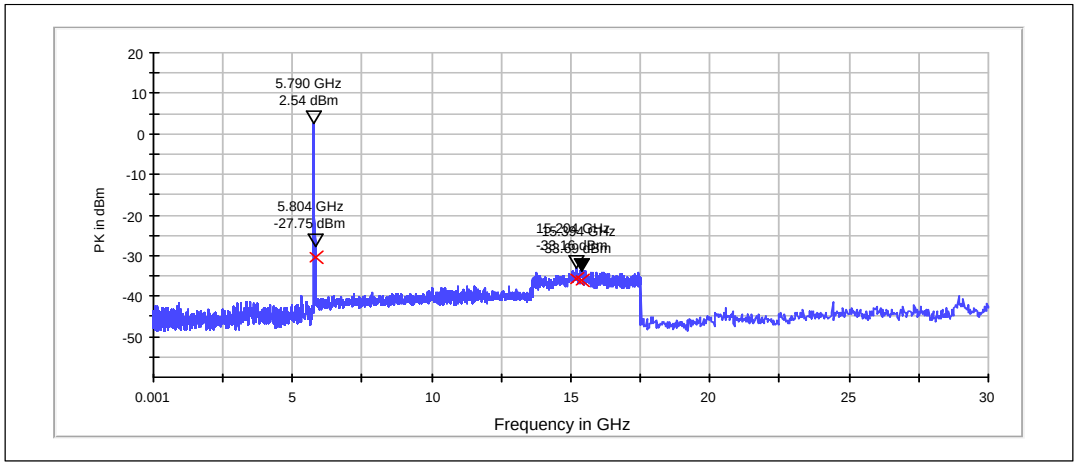
Channel 149 / 5745MHz



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

Frequency [MHz]	P [dBc]	Result
5764.090	-32.71	PASSED
14952.800	-36.01	PASSED
15416.400	-36.44	PASSED

Channel 157 / 5785MHz



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

Frequency [MHz]	P [dBc]	Result
5804.010	-30.29	PASSED
15203.600	-35.69	PASSED
15393.600	-36.22	PASSED

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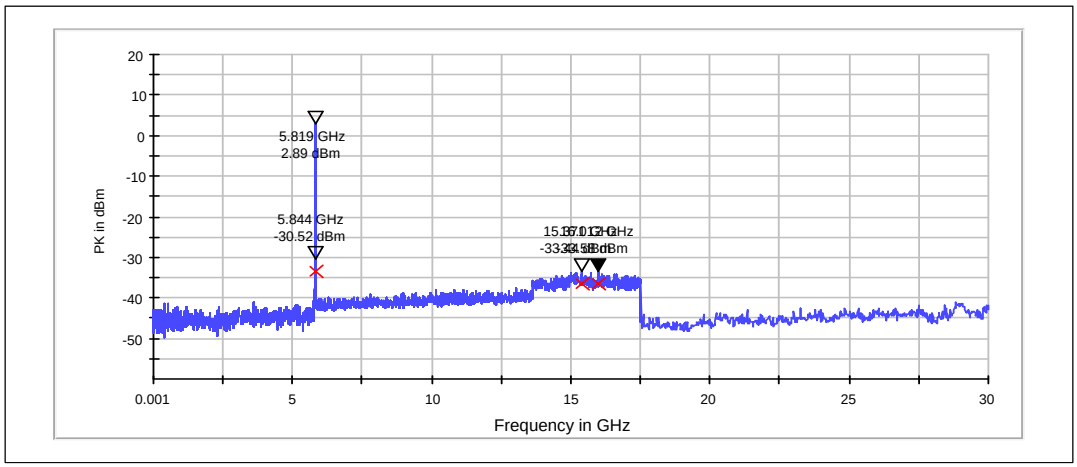
Channel 165 / 5825MHz

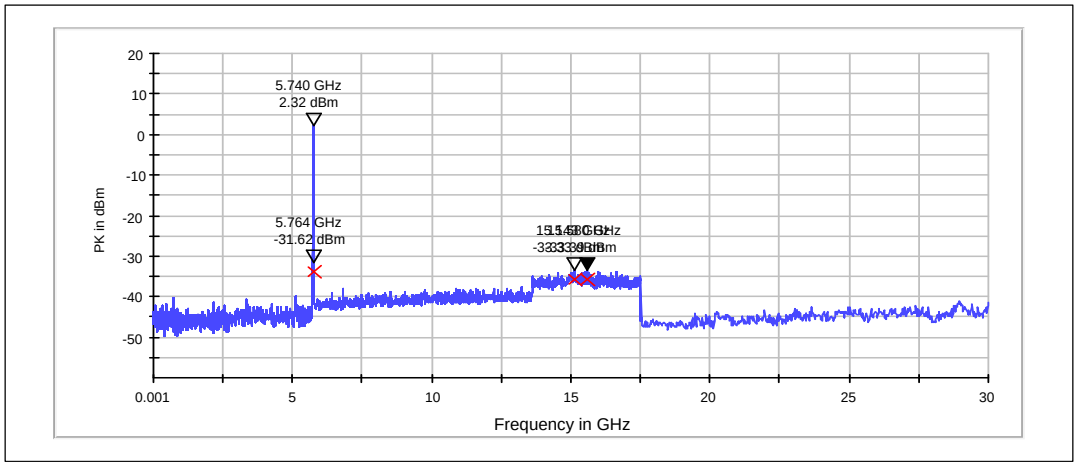


Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
5843.930	-33.41	PASSED
15370.800	-36.33	PASSED
16012.000	-36.47	PASSED

4.4.2 802.11n 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
5764.090	-33.94	PASSED
15142.800	-35.65	PASSED
15580.000	-35.71	PASSED

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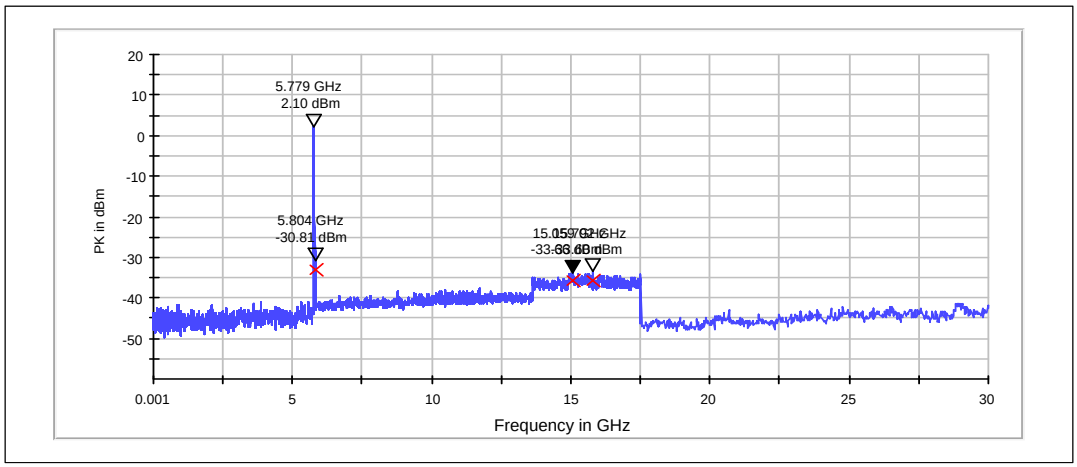
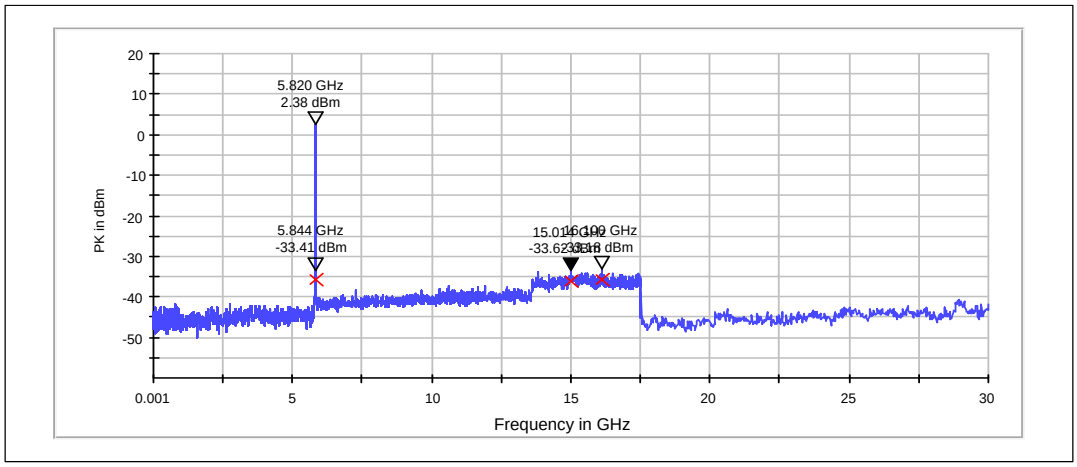
Channel 157 / 5785MHz



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

Frequency [MHz]	P [dBc]	Result
5804.010	-32.90	PASSED
15792.000	-35.69	PASSED
15059.200	-35.76	PASSED

Channel 165 / 5825MHz



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

Frequency [MHz]	P [dBc]	Result
16100.000	-35.56	PASSED
5843.930	-35.79	PASSED
15013.600	-36.00	PASSED

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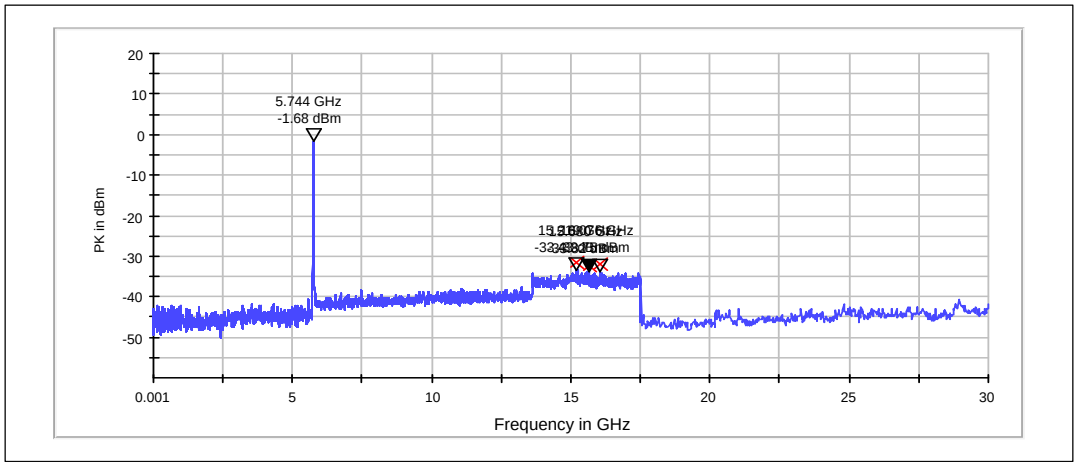
4.4.3 802.11n mode, BPSK modulation, 13.5 / 15.0 Mbps data rate

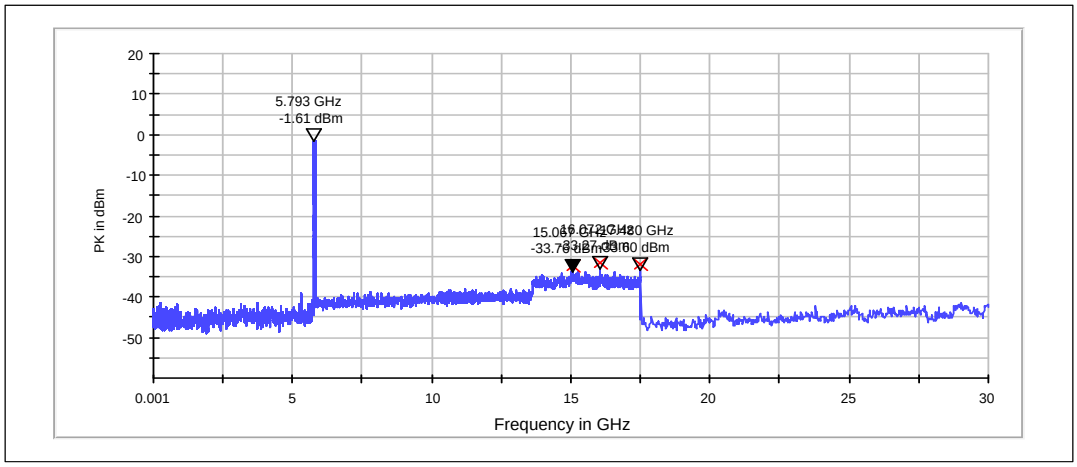
Channel 149+153 / 5755MHz



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

Frequency [MHz]	P [dBc]	Result
15218.800	-31.74	PASSED
16076.000	-32.07	PASSED
15680.000	-32.13	PASSED

Channel 157+161 / 5795MHz



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

Frequency [MHz]	P [dBc]	Result
16072.000	-31.65	PASSED
17480.000	-31.99	PASSED
15066.800	-32.15	PASSED

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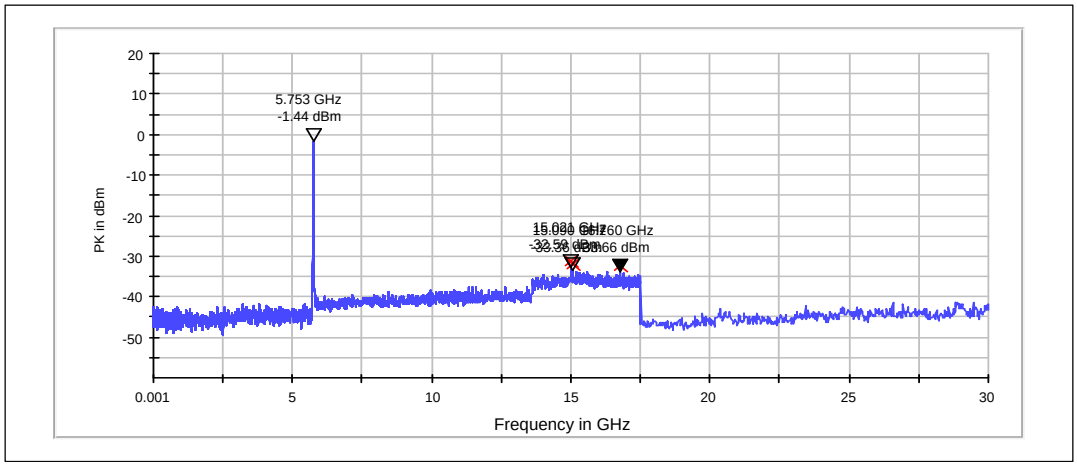
4.4.4 802.11n mode, QPSK modulation, 27.0 / 30.0 Mbps data rate

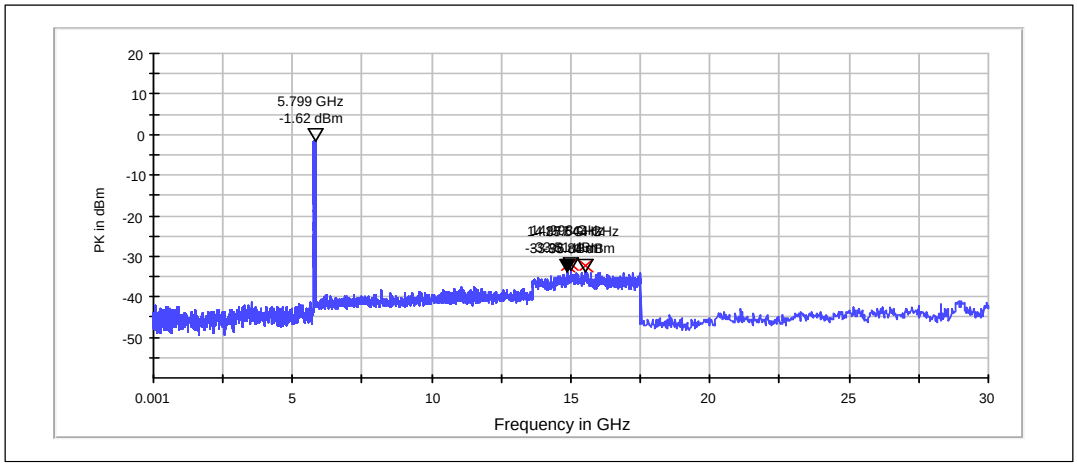
Channel 149+153 / 5755MHz



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

Frequency [MHz]	P [dBc]	Result
15021.200	-31.15	PASSED
15089.600	-31.92	PASSED
16760.000	-32.22	PASSED

Channel 157+161 / 5795MHz



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

Frequency [MHz]	P [dBc]	Result
14998.400	-31.89	PASSED
15544.000	-32.21	PASSED
14876.800	-32.34	PASSED

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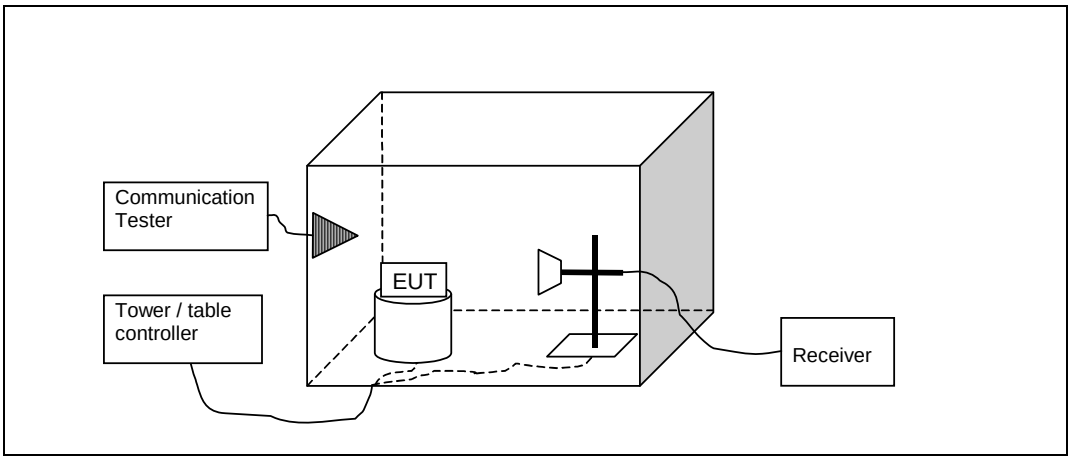
5. Spurious radiated emissions
(FCC 15.247(d), 15.209, RSS-210 A8.5)

EUT with DUT number	RM-984, DUT 43184
Accessories with DUT numbers	BV-L4A, DUT 43185 ; WH-208, DUT 43186 ; AC-60E, DUT 43074 ; CA-190CD, DUT 43034
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	19 / 36 / 98.0
Date of measurements	27-Jun-2014
Measured by	Jari Jantunen

5.1.1 Test setup



5.2. Test method and limit

The measurement is made according to DTS procedures KDB 558074 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.

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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 [µV/m]	Limit [dBµV/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

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5.3. WLANg TX test results

5.3.1 802.11g, 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]	Limit [dBµV/m]	Margin	Results
4824.3	48.23	257.929	53.03	-4.8	74	25.75	PASSED
7237.4	49.01	282.163	48.11	0.9	95	46.22	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
4824.3	34.38	52.36	39.18	-4.8	54	19.6	PASSED
7237.4	33.95	49.831	33.05	0.9	---	---	PASSED

Channel 6 / 2437 MHz

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
908.941	20.47	10.556	37.77	-17.3	46	25.55	PASSED
956.074	36.66	68.077	53.66	-17	46	9.36	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
4882	42.6	134.896	47.1	-4.5	74	31.38	PASSED
7320.2	45.18	181.552	43.88	1.3	74	28.8	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
4882	29.1	28.51	33.6	-4.5	54	24.88	PASSED
7320.2	32.29	41.162	30.99	1.3	54	21.69	PASSED

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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]	Limit [dBµV/m]	Margin	Results
4924.8	50.55	336.899	54.95	-4.4	74	23.43	PASSED
7387.5	48.14	255.27	46.54	1.6	74	25.84	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
4924.8	37.08	71.45	41.48	-4.4	54	16.9	PASSED
7387.5	33.85	49.261	32.25	1.6	54	20.13	PASSED

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5.3.2 802.11g, 64QAM modulation, 54 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]	Limit [dBµV/m]	Margin	Results
4825.2	47.98	250.611	52.78	-4.8	74	26	PASSED
7234.3	48.26	258.821	47.36	0.9	95	46.97	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
4825.2	35.05	56.559	39.85	-4.8	54	18.93	PASSED
7234.3	33.75	48.697	32.85	0.9	---	---	PASSED

Channel 6 / 2437 MHz

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
36.292	27.91	24.86	50.41	-22.5	40	12.09	PASSED
956.074	38.87	87.801	55.87	-17	46	7.15	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
4878	41.45	118.168	45.95	-4.5	74	32.53	PASSED
7320.2	44.92	176.198	43.62	1.3	74	29.06	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
4878	28.22	25.763	32.72	-4.5	54	25.76	PASSED
7320.2	32.25	40.973	30.95	1.3	54	21.73	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]	Limit [dBµV/m]	Margin	Results
4923.7	49.5	298.538	53.9	-4.4	74	24.48	PASSED
7384.5	50.1	319.89	48.5	1.6	74	23.88	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
4923.7	36.31	65.388	40.71	-4.4	54	17.67	PASSED
7384.5	34.67	54.138	33.07	1.6	54	19.31	PASSED

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5.4. 5 GHz RLAN test results

5.4.1 802.11n, BPSK modulation, 6.5 / 7.25 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]	Limit [dBµV/m]	Margin	Results
11490.7	49.65	303.739	42.35	7.3	74	24.33	PASSED
17239.2	43.94	157.398	40.84	3.1	95	51.29	PASSED
22976.9	46.53	212.08	40.63	5.9	74	27.45	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11490.7	36.57	67.375	29.27	7.3	54	17.41	PASSED
17239.2	30.97	35.359	27.87	3.1	---	---	PASSED
22976.9	33.2	45.709	27.3	5.9	54	20.78	PASSED

Channel 157 / 5785MHz

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
35.76	26.12	20.23	48.62	-22.5	40	13.88	PASSED
35.94	26.37	20.821	48.97	-22.6	40	13.63	PASSED
36.21	26.89	22.105	49.59	-22.7	40	13.11	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11567.7	48.96	280.543	41.56	7.4	74	25.02	PASSED
17353.4	43.71	153.285	40.61	3.1	95	51.52	PASSED
23133.8	46.86	220.293	40.86	6	95	48.37	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11567.7	36.03	63.314	28.63	7.4	54	17.95	PASSED
17353.4	30.72	34.356	27.62	3.1	---	---	PASSED
23133.8	33.94	49.774	27.94	6	---	---	PASSED

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Channel 165 / 5825MHz

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11649.8	49.94	314.051	42.74	7.2	74	24.04	PASSED
17440.2	43.65	152.23	40.35	3.3	95	51.58	PASSED
23295.2	47.89	248.028	41.69	6.2	95	47.34	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11649.8	37.49	74.903	30.29	7.2	54	16.49	PASSED
17440.2	30.74	34.435	27.44	3.3	---	---	PASSED
23295.2	33.97	49.946	27.77	6.2	---	---	PASSED

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5.4.2 802.11n, 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]	Limit [dBµV/m]	Margin	Results
11484.7	50.11	320.258	42.91	7.2	74	23.87	PASSED
17244.7	44.23	162.742	41.13	3.1	95	51	PASSED
22974.4	45.86	196.336	39.96	5.9	74	28.12	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11484.7	36.41	66.145	29.21	7.2	54	17.57	PASSED
17244.7	31.02	35.563	27.92	3.1	---	---	PASSED
22974.4	33.22	45.814	27.32	5.9	54	20.76	PASSED

Channel 157 / 5785MHz

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
35.76	26.12	20.23	48.62	-22.5	40	13.88	PASSED
35.91	26.31	20.678	48.91	-22.6	40	13.69	PASSED
954.014	19.23	9.152	37.73	-18.5	46	26.79	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11573.2	49	281.838	41.7	7.3	74	24.98	PASSED
17353.7	44.21	162.368	41.11	3.1	95	51.02	PASSED
23143.2	47.36	233.346	41.26	6.1	95	47.87	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11573.2	35.95	62.734	28.65	7.3	54	18.03	PASSED
17353.7	30.76	34.514	27.66	3.1	---	---	PASSED
23143.2	34.06	50.466	27.96	6.1	---	---	PASSED

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Channel 165 / 5825MHz

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11654	48.69	271.957	41.59	7.1	74	25.29	PASSED
17437.7	43.92	157.036	40.62	3.3	95	51.31	PASSED
23295.9	46.9	221.309	40.7	6.2	95	48.33	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11654	35.74	61.235	28.64	7.1	54	18.24	PASSED
17437.7	30.65	34.08	27.35	3.3	---	---	PASSED
23295.9	33.9	49.545	27.7	6.2	---	---	PASSED

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5.4.3 802.11n, BPSK modulation, 13.5 / 15 Mbps data rate.

Channel 149+153 / 5755MHz

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
35.13	25.49	18.815	47.79	-22.3	40	14.51	PASSED
35.912	26.19	20.394	48.79	-22.6	40	13.81	PASSED
35.97	26.43	20.965	49.03	-22.6	40	13.57	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11508.1	49.41	295.461	42.01	7.4	74	24.57	PASSED
17268.3	43.74	153.815	40.54	3.2	95	51.49	PASSED
23020.1	46.03	200.217	39.93	6.1	74	27.95	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11508.1	36.36	65.766	28.96	7.4	54	17.62	PASSED
17268.3	31.09	35.851	27.89	3.2	---	---	PASSED
23020.1	33.27	46.079	27.17	6.1	54	20.71	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]	Limit [dBµV/m]	Margin	Results
11575.8	49.62	302.691	42.32	7.3	74	24.36	PASSED
17403.8	43.86	155.955	40.56	3.3	95	51.37	PASSED
23163.5	47.17	228.297	41.07	6.1	95	48.06	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11575.8	35.92	62.517	28.62	7.3	54	18.06	PASSED
17403.8	30.92	35.156	27.62	3.3	---	---	PASSED
23163.5	33.86	49.317	27.76	6.1	---	---	PASSED

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5.4.4 802.11n, QPSK modulation, 27 / 30 Mbps data rate.

Channel 149+153 / 5755MHz

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
35.85	26.78	21.827	49.38	-22.6	40	13.22	PASSED
35.966	26.93	22.208	49.53	-22.6	40	13.07	PASSED
36.302	27.44	23.55	50.24	-22.8	40	12.56	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11511.2	49.18	287.74	41.68	7.5	74	24.8	PASSED
17263.5	44.25	163.117	41.05	3.2	95	50.98	PASSED
23019.8	47.59	239.607	41.49	6.1	74	26.39	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11511.2	36.36	65.766	28.86	7.5	54	17.62	PASSED
17263.5	31.1	35.892	27.9	3.2	---	---	PASSED
23019.8	34.54	53.333	28.44	6.1	54	19.44	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]	Limit [dBµV/m]	Margin	Results
11597.8	48.88	277.971	41.58	7.3	74	25.1	PASSED
17379.9	43.77	154.348	40.57	3.2	95	51.46	PASSED
23180.1	47.88	247.742	41.88	6	95	47.35	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Limit [dBµV/m]	Margin	Results
11597.8	36.08	63.68	28.78	7.3	54	17.9	PASSED
17379.9	30.83	34.794	27.63	3.2	---	---	PASSED
23180.1	36.14	64.121	30.14	6	---	---	PASSED

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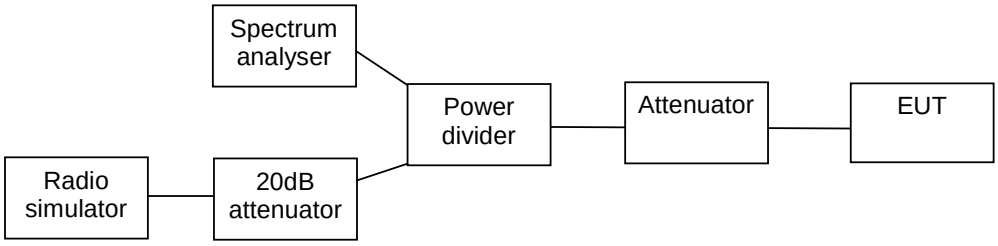
6. 6dB(bandwidth)

(FCC §15.247(a)(2), RSS-210 A8.2(a))

EUT with DUT number	RM-984, DUT 43187
Accessories with DUT numbers	BV-L4A, DUT 43188
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20-24 / 42-49 / 98.1-98.2
Date of measurements	26-Jun.. 02-Jul-2014
Measured by	Jari Jantunen

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.

Limits for 6 dB bandwidth measurements

Limit [kHz]
>= 500

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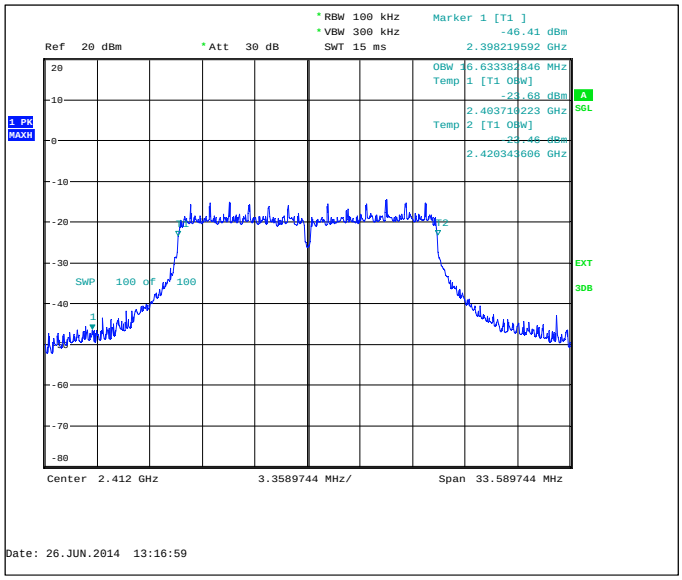
6.3. WLAN Test results

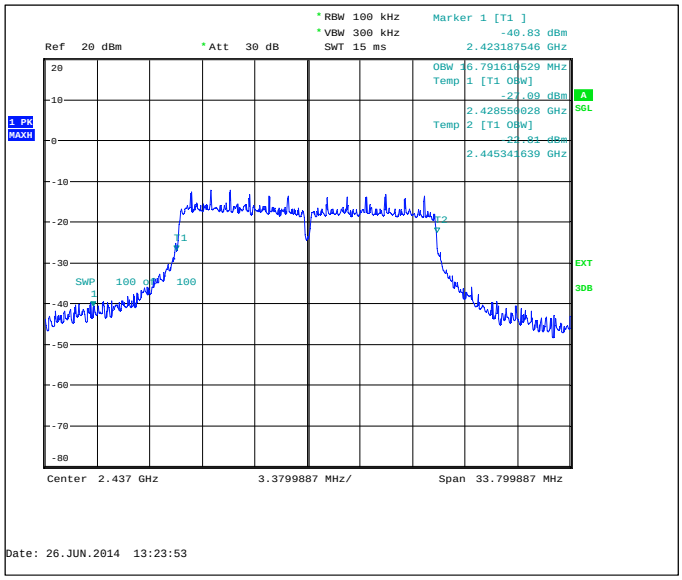
6.3.1 802.11g mode, BPSK modulation, 6 Mbps data rate

Channel / f_C [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	16633.4	PASSED
6 / 2437	16791.6	PASSED
11 / 2462	16736.8	PASSED

Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



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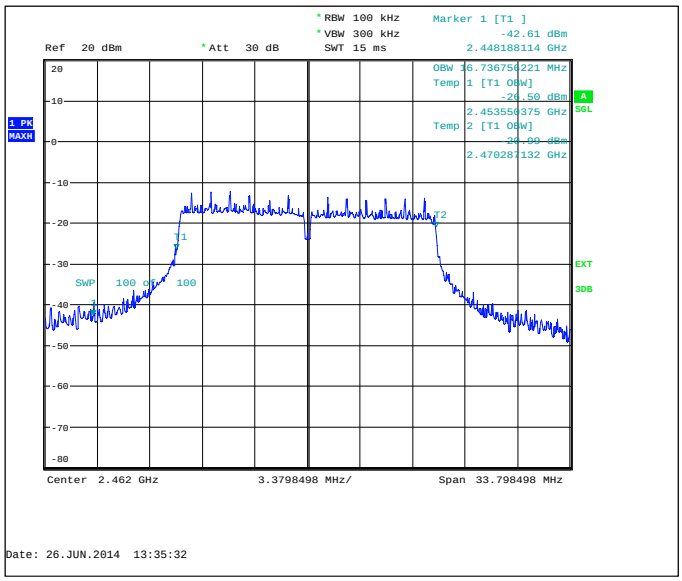
Channel 11 / 2462 MHz



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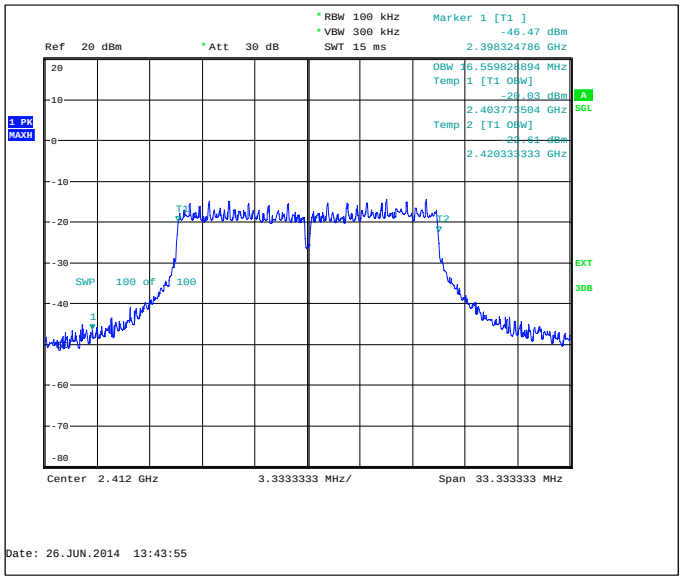
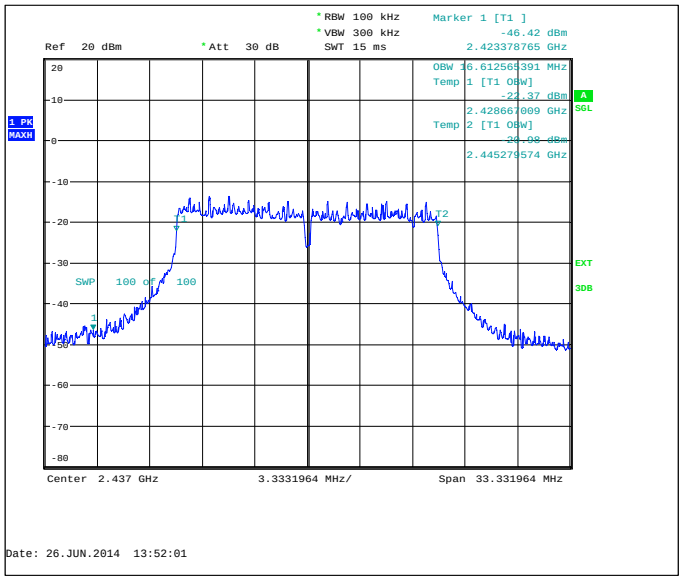
6.3.2 802.11g mode, 64QAM modulation, 54 Mbps data rate

Channel / f_C [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	16559.8	PASSED
6 / 2437	16612.6	PASSED
11 / 2462	16504.7	PASSED

Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



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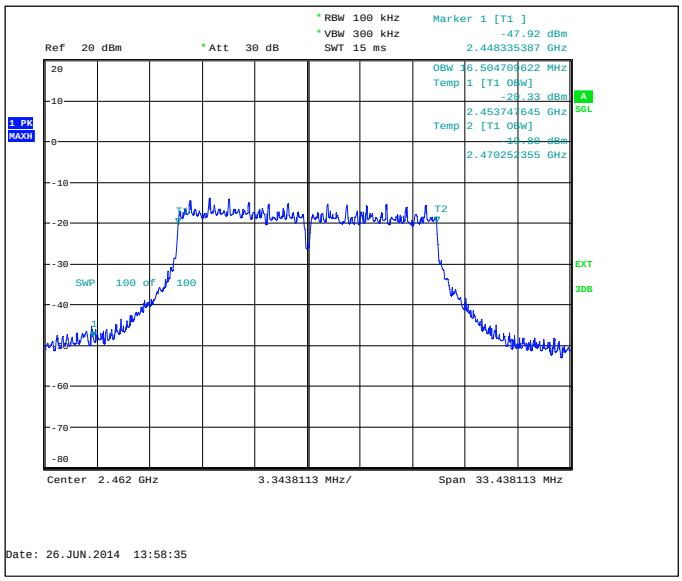
Channel 11 / 2462 MHz



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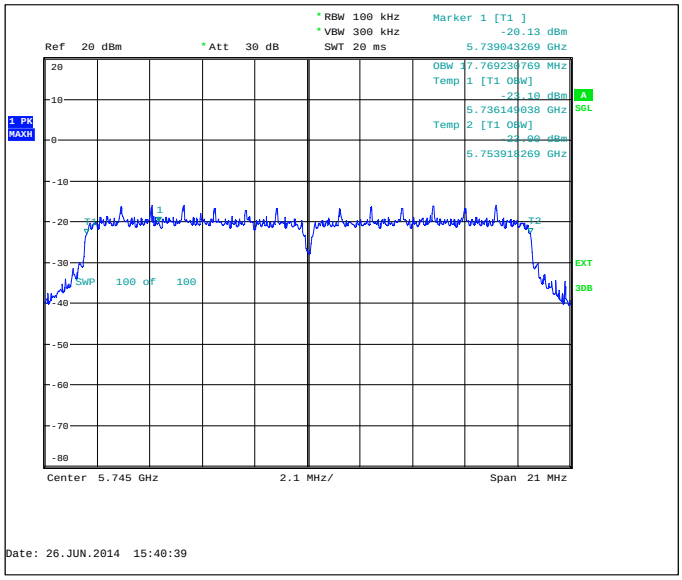
6.4. 5 GHz RLAN Test results

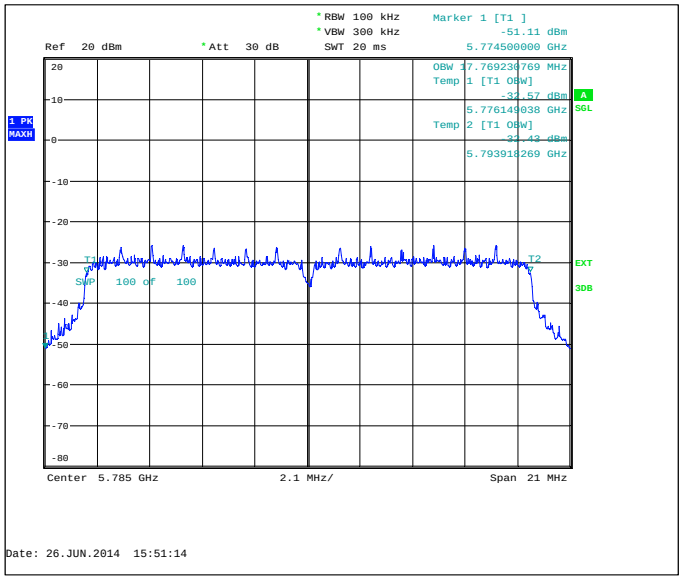
6.4.1 802.11n mode, BPSK modulation, 6.5 / 7.25 Mbps data rate

Channel / f_C [MHz]	6 dB bandwidth [kHz]	Result
149 / 5745	17769.2	PASSED
157 / 5785	17769.2	PASSED
165 / 5825	17769.2	PASSED

Channel 149 / 5745MHz



Channel 157 / 5785MHz



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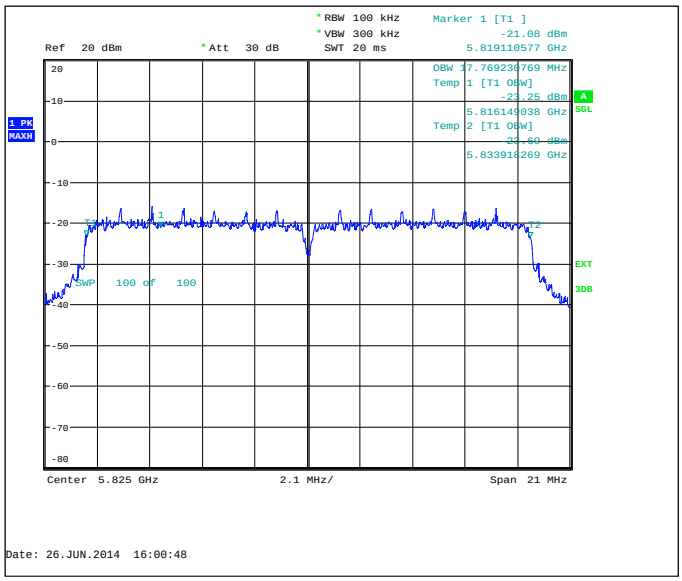
Channel 165 / 5825MHz



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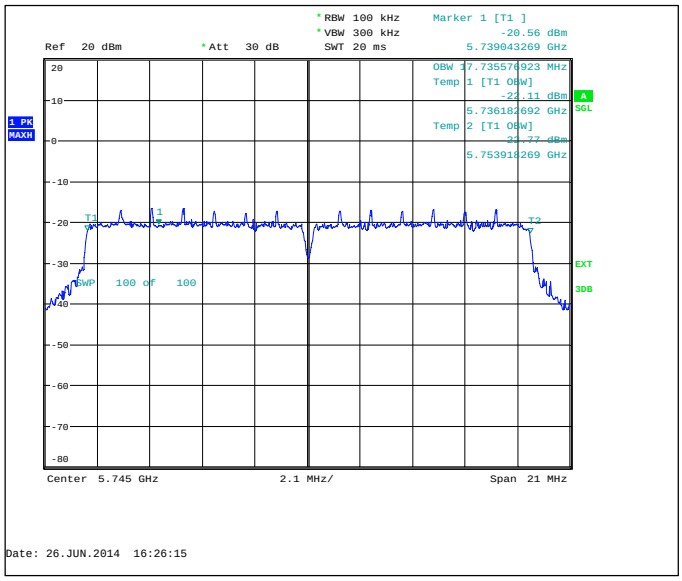
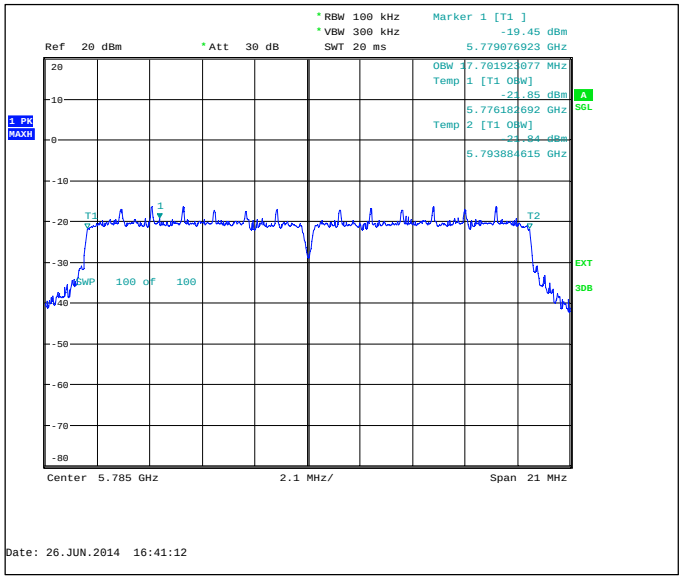
6.4.2 802.11n mode, QPSK modulation, 19.5 / 21.7 Mbps data rate

Channel / f_C [MHz]	6 dB bandwidth [kHz]	Result
149 / 5745	17735.6	PASSED
157 / 5785	17701.9	PASSED
165 / 5825	17769.2	PASSED

Channel 149 / 5745MHz



Channel 157 / 5785MHz



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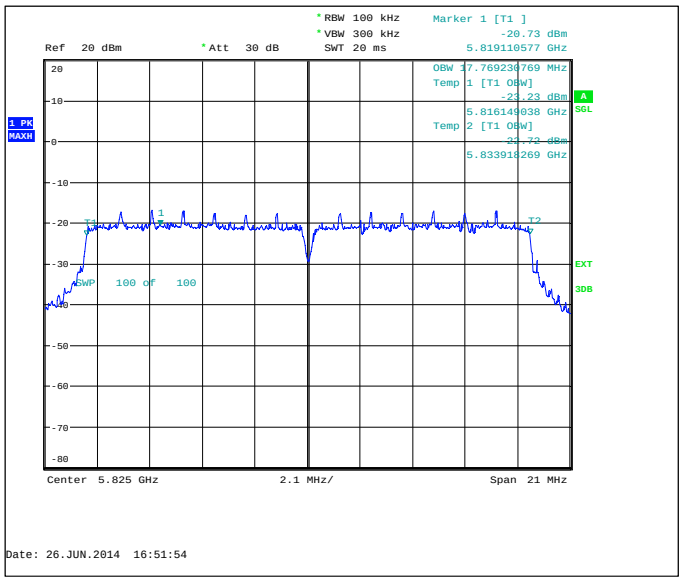
Channel 165 / 5825MHz



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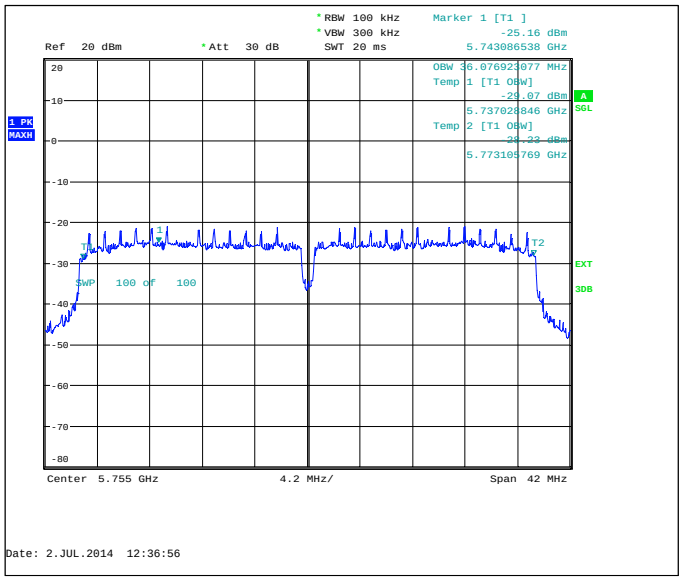
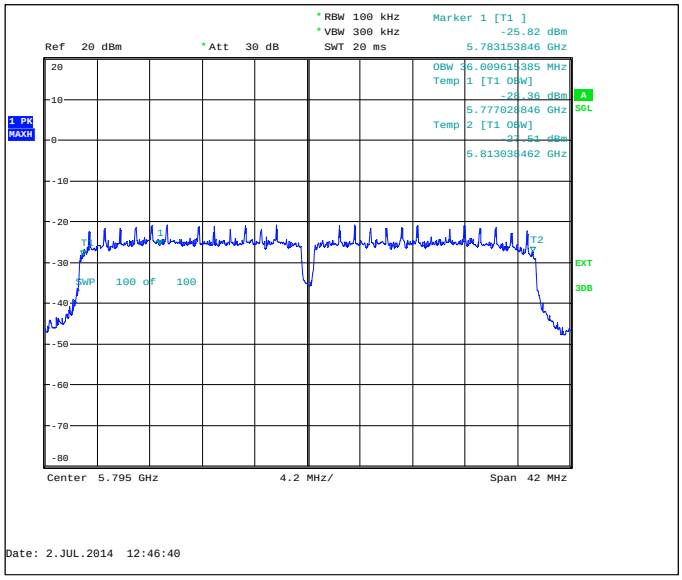
6.4.3 802.11n mode, BPSK modulation, 13.5 / 15.0 Mbps data rate

Channel / f_C [MHz]	6 dB bandwidth [kHz]	Result
149+153 / 5755	36076.9	PASSED
157+161 / 5795	36009.6	PASSED

Channel 149+153 / 5755MHz



Channel 157+161 / 5795MHz



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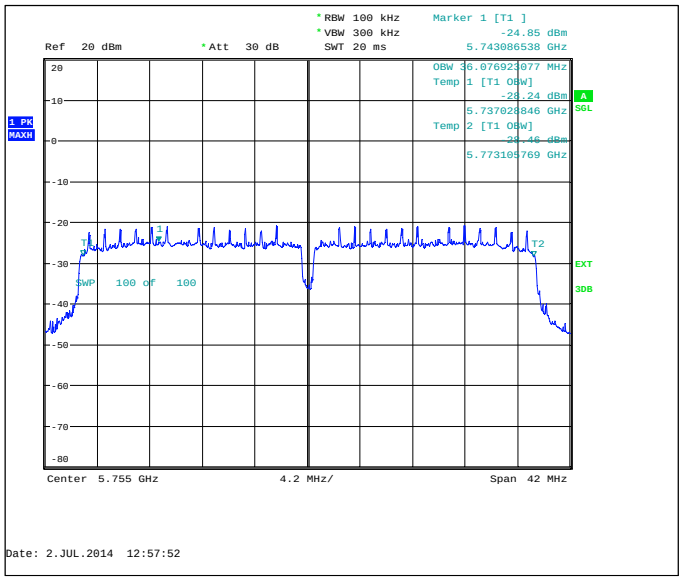
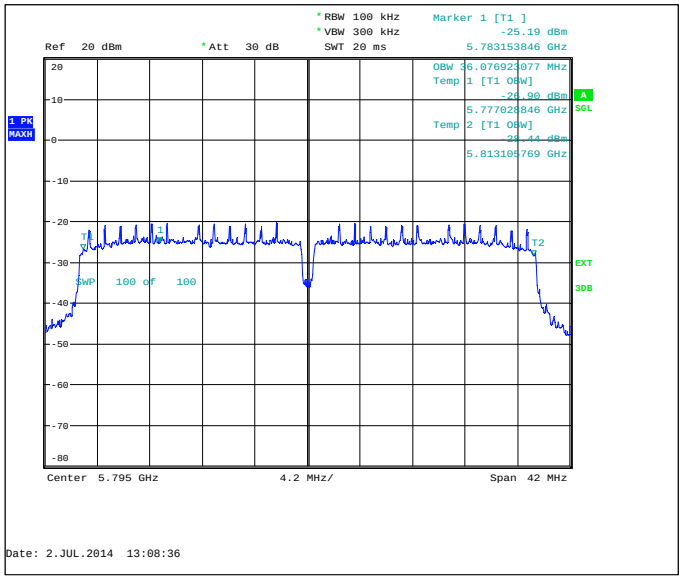
6.4.4 802.11n mode, QPSK modulation, 27.0 / 30.0 Mbps data rate

Channel / f_C [MHz]	6 dB bandwidth [kHz]	Result
149+153 / 5755	36076.9	PASSED
157+161 / 5795	36076.9	PASSED

Channel 149+153 / 5755MHz



Channel 157+161 / 5795MHz



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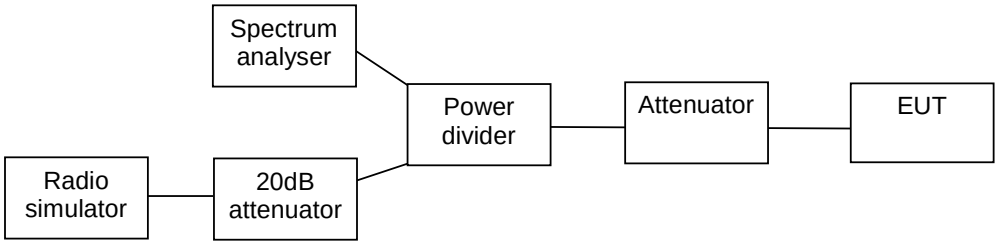
7. Power spectral density
(FCC §15.247(e), RSS-210 A8.2(b))

EUT with DUT number	RM-984, DUT 43187
Accessories with DUT numbers	BV-L4A, DUT 43188
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20-24 / 42-49 / 98.1-98.2
Date of measurements	26-Jun.. 02-Jul-2014
Measured by	Jari Jantunen

7.1. Test Setup



7.2. Test method and limit

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

Limits for power spectral density measurements

Limit [dBm] @ 3 kHz
<= 8

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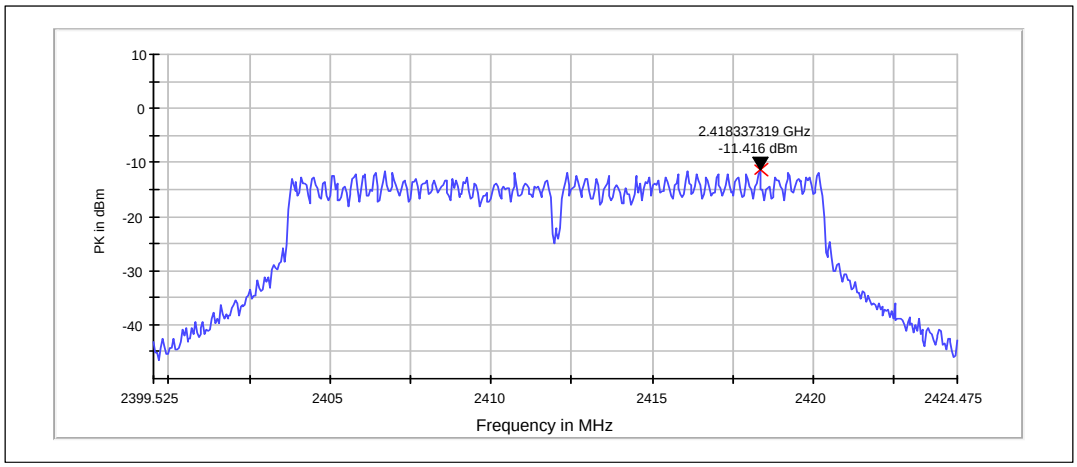
7.3. WLAN Test results

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

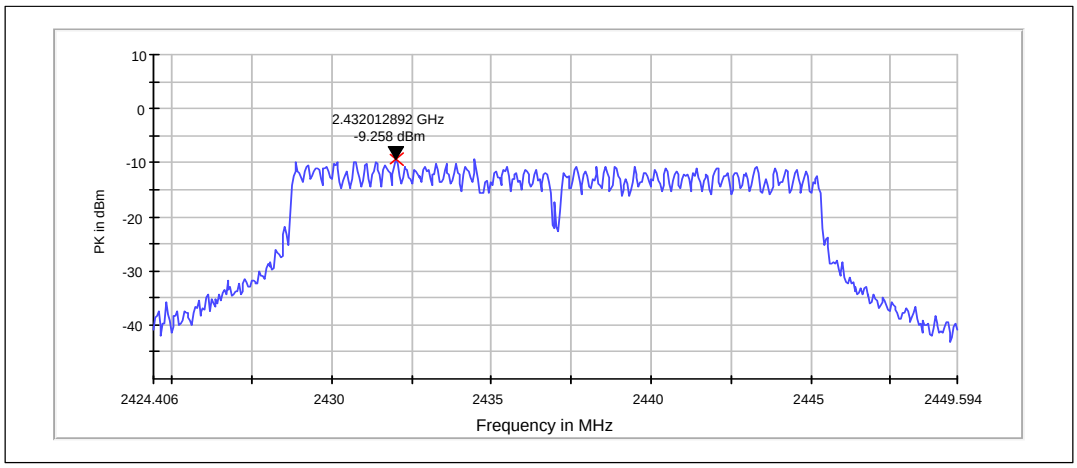
Peak (RBW: 3 kHz, VBW: 10 kHz, Max hold)

Channel / f_C [MHz]	P [dBm]	Result
1 / 2412	-11.42	PASSED
6 / 2437	-9.26	PASSED
11 / 2462	-8.39	PASSED

Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



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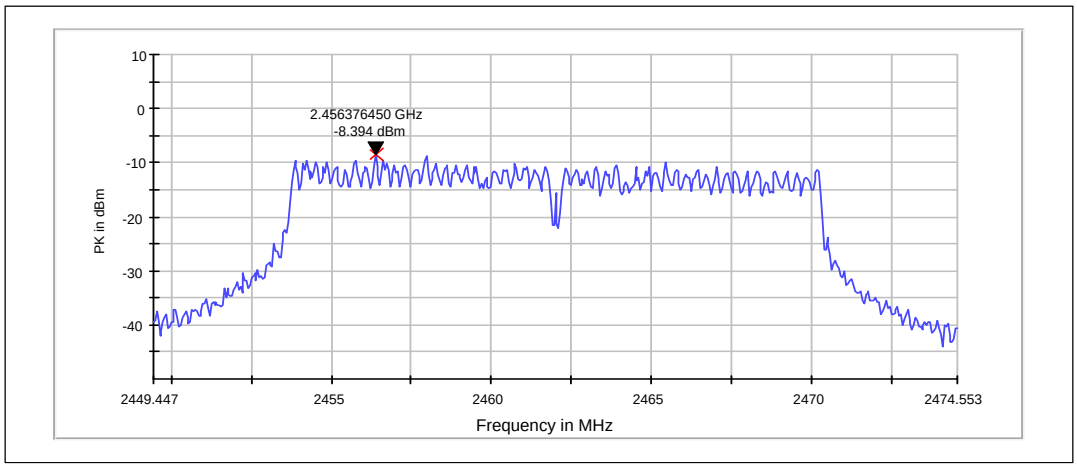
Channel 11 / 2462 MHz



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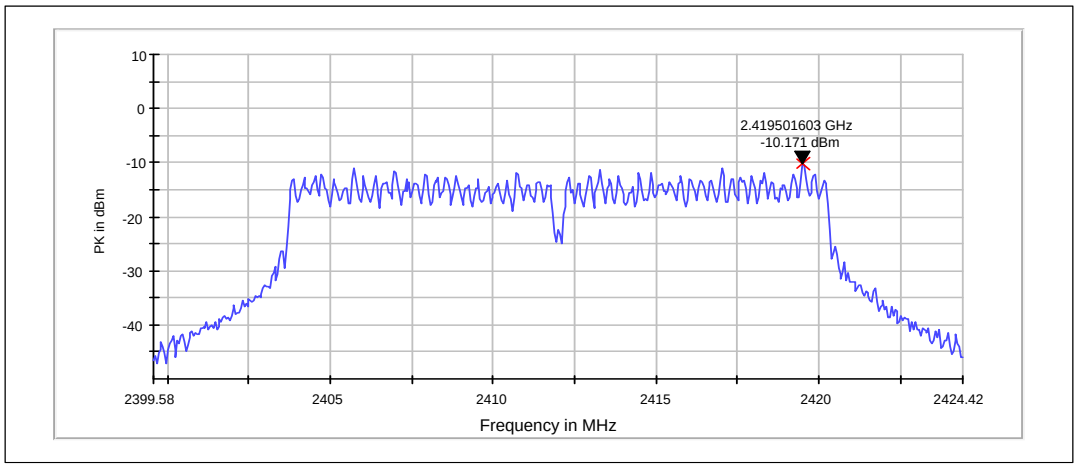
7.3.2 802.11g mode, 64QAM modulation, 54 Mbps data rate

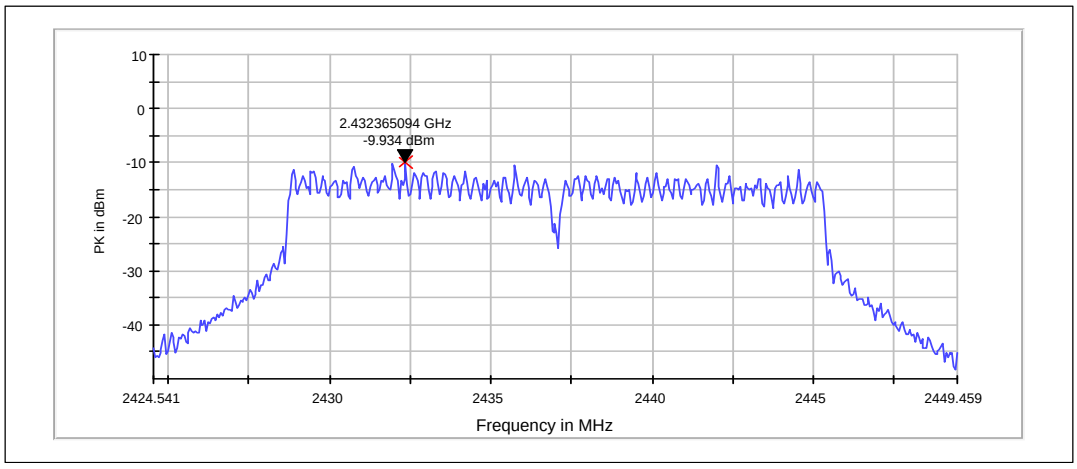
Peak (RBW: 3 kHz, VBW: 10 kHz, Max hold)

Channel / f_C [MHz]	P [dBm]	Result
1 / 2412	-10.17	PASSED
6 / 2437	-9.93	PASSED
11 / 2462	-10.37	PASSED

Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



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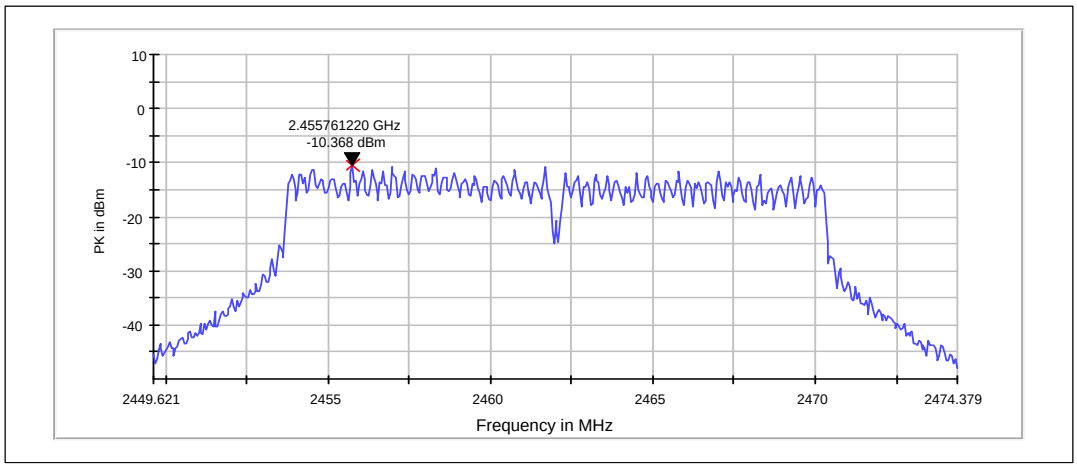
Channel 11 / 2462 MHz



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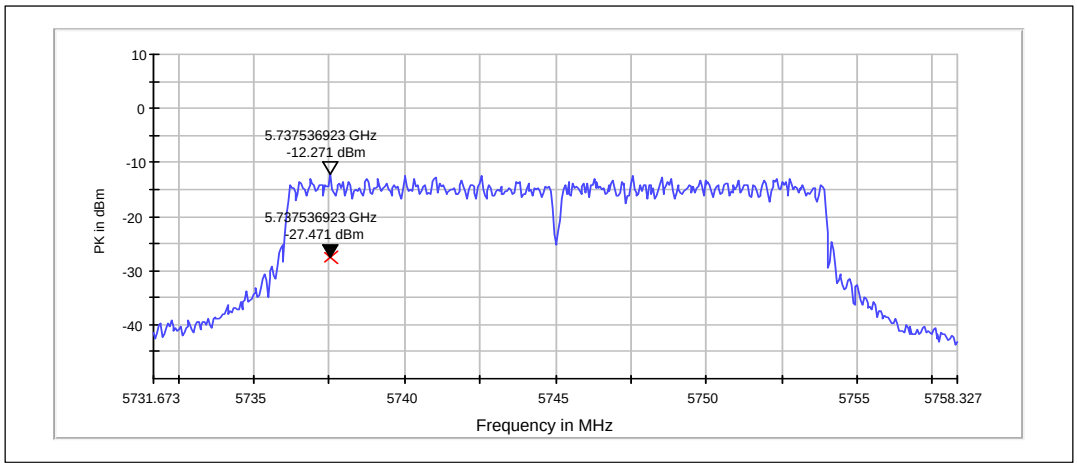
7.4. 5 GHz RLAN Test results

7.4.1 802.11n mode, BPSK modulation, 6.5 / 7.25 Mbps data rate

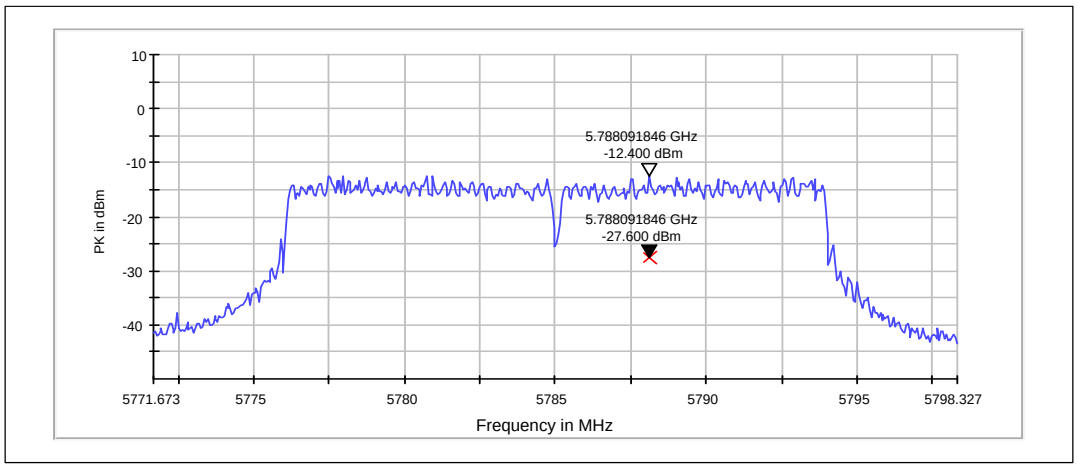
Peak (RBW: 3 kHz, VBW: 10 kHz, Max hold)

Channel / f_C [MHz]	P [dBm]	Result
149 / 5745	-27.47	PASSED
157 / 5785	-27.6	PASSED
165 / 5825	-27.45	PASSED

Channel 149 / 5745MHz



Channel 157 / 5785MHz



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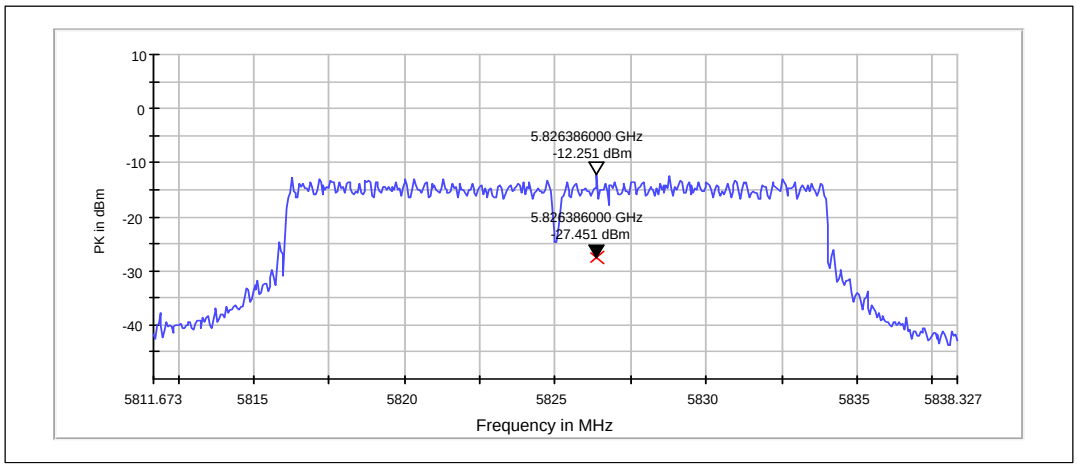
Channel 165 / 5825MHz



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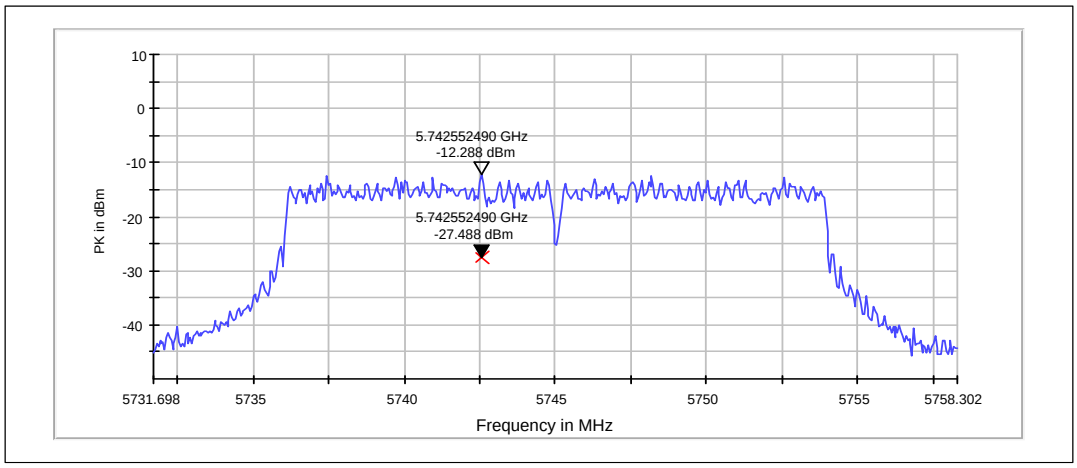
7.4.2 802.11n mode, QPSK modulation, 19.5 / 21.7 Mbps data rate

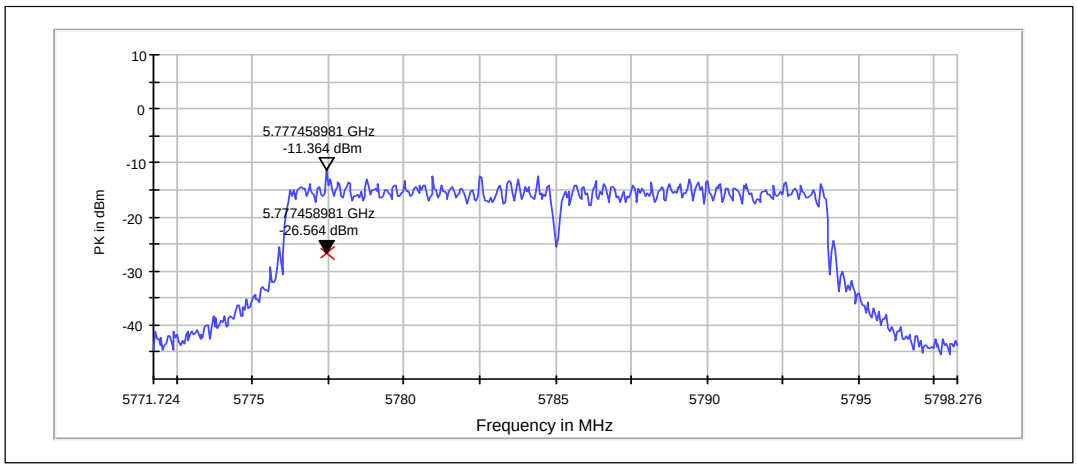
Peak (RBW: 3 kHz, VBW: 10 kHz, Max hold)

Channel / f_C [MHz]	P [dBm]	Result
149 / 5745	-27.49	PASSED
157 / 5785	-26.56	PASSED
165 / 5825	-27.16	PASSED

Channel 149 / 5745MHz



Channel 157 / 5785MHz



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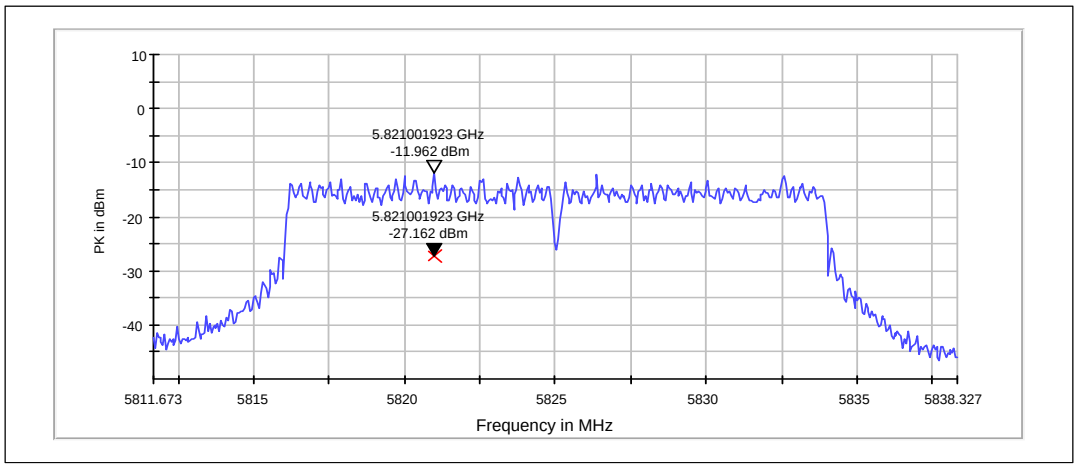
Channel 165 / 5825MHz



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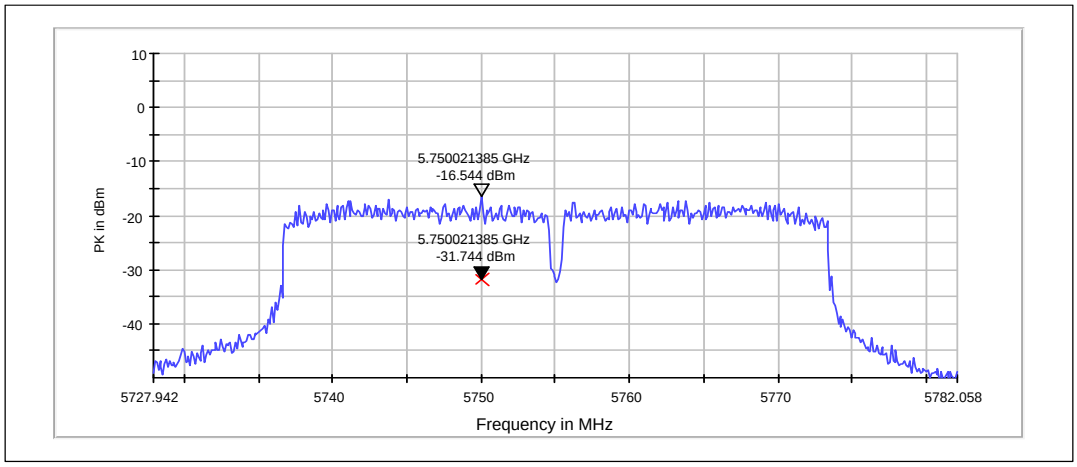
7.4.3 802.11n mode, BPSK modulation, 13.5 / 15.0 Mbps data rate

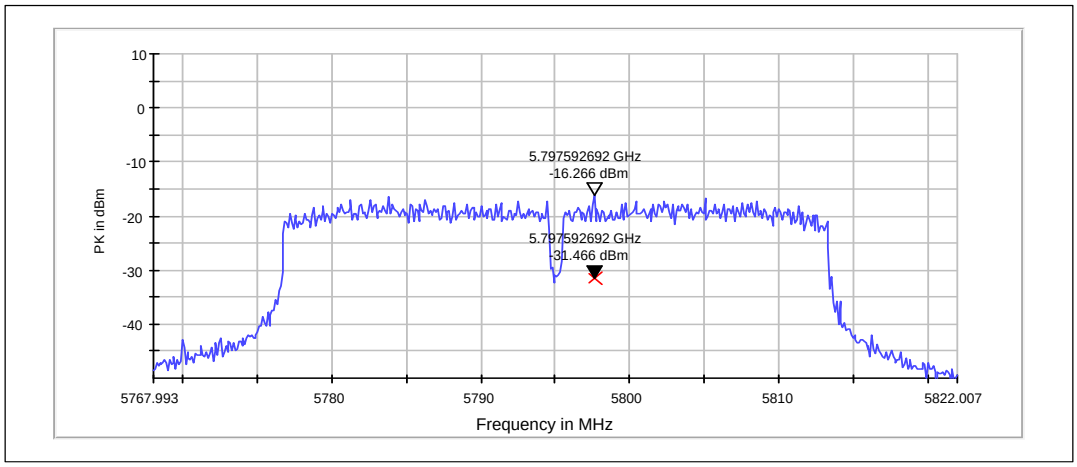
Peak (RBW: 3 kHz, VBW: 10 kHz, Max hold)

Channel / f_C [MHz]	P [dBm]	Result
149+153 / 5755	-31.74	PASSED
157+161 / 5795	-31.47	PASSED

Channel 149+153 / 5755MHz



Channel 157+161 / 5795MHz



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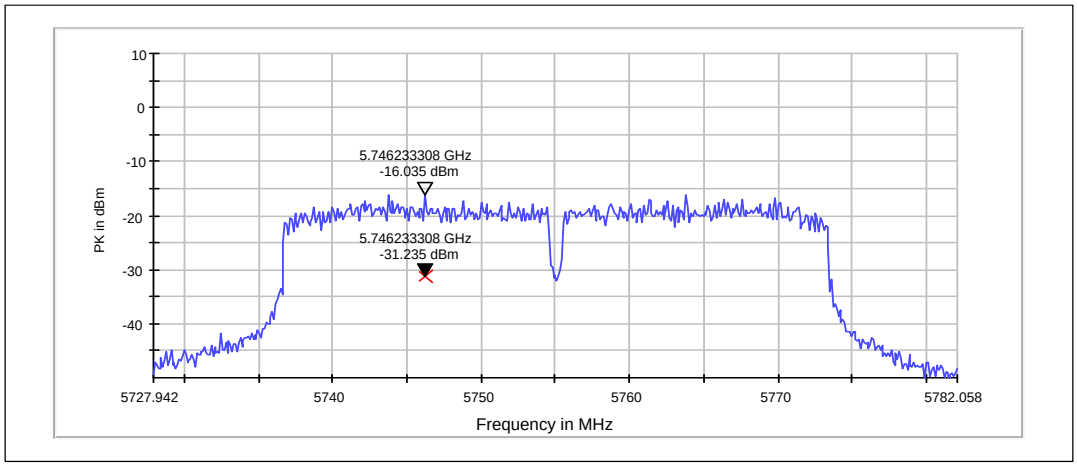
7.4.4 802.11n mode, QPSK modulation, 27.0 / 30.0 Mbps data rate

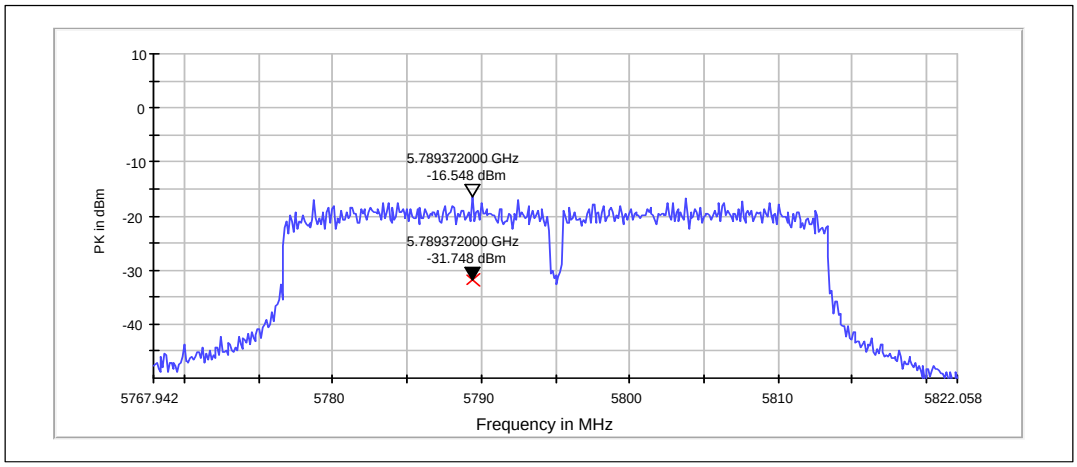
Peak (RBW: 3 kHz, VBW: 10 kHz, Max hold)

Channel / f_C [MHz]	P [dBm]	Result
149+153 / 5755	-31.24	PASSED
157+161 / 5795	-31.75	PASSED

Channel 149+153 / 5755MHz



Channel 157+161 / 5795MHz



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8. Test Equipment

8.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM38112	Power supply	6632A	Agilent	22/24/27, 15C, 15E
TM38114	Power supply	6632A	Agilent	22/24/27, 15C, 15E
TM37773	Communication Tester	CMU200	R&S	22/24/27, 15B
TM30600	Impulse limiter	ESH3-Z2	R&S	15C, 15B
TM26490	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM26491	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM37610	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
2021	Communication Tester	CMW500	R&S	22/24/27
2022	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
2026	Signal Generator	SMF 100A	R&S	22/24/27, 15C, 15E, 15B
-	Bluetooth tester	CBT	R&S	15C, 15B

8.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
-	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C
TM37678	Communication Tester	CMU200	R&S	22/24/27, 15B
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

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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
6023	Antenna	VUBA 9117	Schwarzbeck	22/24/27
2021	Communication Tester	CMW500	R&S	22/24/27
2025	Antenna	HFH2-Z2	R&S	15C
2026	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
-	Bluetooth tester	CBT	R&S	15C, 15B

TCC Microsoft Tampere Laboratory
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