

FCC Part 15C Compliance Test Report

Test Report no.:	FCC15CWLAN_RM-1073_77	Date of Report:	11-Feb-2015
Number of pages:	38	Customer's Contact person:	Juha Paukku
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FCC listing no.:	94436		
IC recognition no.:	661AK-1		
Tested devices/ accessories:	Phone RM-1073 / Battery BV-T5C / AC charger AC-20E / Headset WH-108		
FCC ID:	PYARM-1073	IC:	661X-RM1073
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2009), 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:			

Kalle Hannila, System Manager, EMC

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	03-Dec-2014
Testing completed	
The customer's contact person	Juha Paukku
Test Plan referred to	T:\Projects\RM-1072\TestPlan\RS_testplan_RM-1072.xlsm
Notes	-
Document name	T:\Projects\RM-1072\EMC\FCC15CWLAN_RM-1072_02.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-1072	004402740483304	1500	-	02148.00000.14431.29000	43231
Battery	BV-T5C	-	LG HW3.0	-	-	43232
AC charger	AC-20E	4868673411351126865;0675628	-	-	-	43140
Headset	WH-108	4163271	-	-	-	43213
Phone	RM-1072	004402740484500	1500	-	02148.00000.14431.29000	43234
Battery	BV-T5C	-	LG HW3.0	-	-	43235
AC charger	AC-20E	4090494156670711801;0675628	-	-	-	43229
Headset	WH-108	4235VFA	-	-	-	43230
Phone	RM-1072	004402740484534	1500	-	02148.00000.14431.29000	43238

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	8.8	AC powerline conducted emissions	PASSED
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 PYARM-1072 are re-used for certification of the PYARM-1073. The table above indicates the results, which will be re-used.

CONTENTS

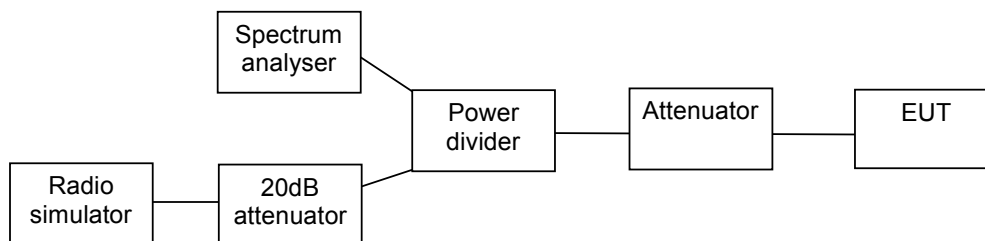
1. Summary for FCC Part 15C Compliance Test Report.....	2
1.1. EUT and Accessory Information.....	2
1.2. Summary of Test Results.....	2
2. Conducted peak output power (FCC §15.247(b)(1), RSS-210 A8.4(4)).....	5
2.1. Test Setup.....	5
2.2. Test method and limit.....	5
2.3. Power results summary all data speeds.....	6
2.4. Power results summary.....	6
2.5. WLAN Test results	7
3. Band edge compliance of RF emissions (FCC 15.247(d), 15.205(b), RSS-210 A8.5).....	11
3.2. Test method and limit.....	11
3.3. WLAN test results	12
4. Spurious RF conducted emissions (FCC §15.247(d), RSS-210 A8.5).....	16
4.1. Test Setup.....	16
4.2. Test method and limit.....	16
4.3. WLAN Test results	17
5. Spurious radiated emissions (FCC 15.247(d), 15.209, RSS-210 A8.5)	21
5.2. Test method and limit.....	21
5.3. WLAN test results	23
6. AC powerline conducted emissions (FCC §15.207, RSS-210 7.2.4).....	25
6.1. Test Setup.....	25
6.2. Test method and limit.....	25
6.3. WLAN Test results	26
7. 6dB(bandwidth) (FCC §15.247(a)(2), RSS-210 A8.2(a)).....	28
7.1. Test Setup.....	28
7.2. Test method and limit.....	28
7.3. WLAN Test results	29
8. Power spectral density (FCC §15.247(e), RSS-210 A8.2(b))	32
8.1. Test Setup.....	32

8.2.	Test method and limit.....	32
8.3.	WLAN Test results	33
9.	Test Equipment.....	36
9.1.	Conducted measurements	36
9.2.	Radiated measurements	37

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

EUT with DUT number	RM-1072, DUT 43231
Accessories with DUT numbers	BV-T5C DUT 43232, AC-20E DUT43140, WH-108 DUT43213
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 38 / 102
Date of measurements	24-Nov-2014
Measured by	Hannu Söderholm

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 all data speeds

Channel / f _c [MHz]	Mode	Modulation	Data rate	Level [dBm]
1 / 2412	802.11b	BPSK	1 Mbps	20.01
6 / 2437	802.11b	BPSK	1 Mbps	20.22
6 / 2437	802.11b	BPSK	1 Mbps	20.57
6 / 2437	802.11b	QPSK	2 Mbps	20.94
6 / 2437	802.11b	QPSK	5.5 Mbps	22.47
6 / 2437	802.11b	QPSK	11 Mbps	23.67
6 / 2437	802.11g	BPSK	6 Mbps	24.02
6 / 2437	802.11g	BPSK	9 Mbps	23.92
6 / 2437	802.11g	QPSK	12 Mbps	23.6
6 / 2437	802.11g	QPSK	18 Mbps	23.56
6 / 2437	802.11g	16QAM	24 Mbps	24.17
6 / 2437	802.11g	16QAM	36 Mbps	22.95
6 / 2437	802.11g	16QAM	48 Mbps	22.13
6 / 2437	802.11g	16QAM	54 Mbps	21.05

2.4. Power results summary

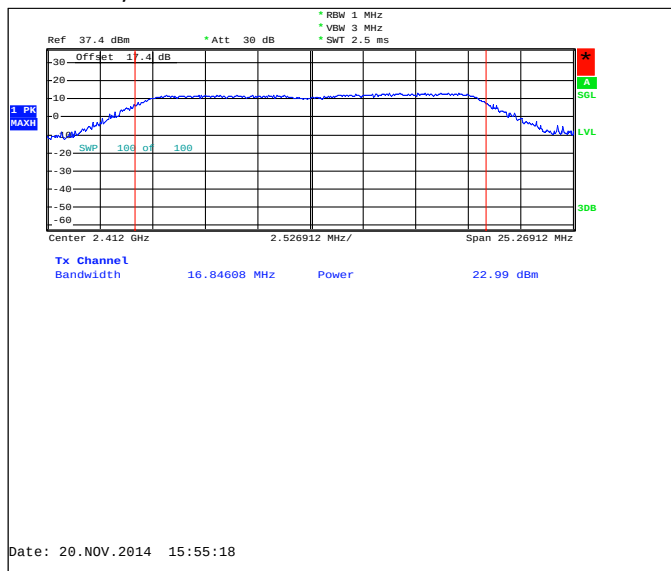
Channel / f _c [MHz]	Mode	Modulation	Data rate	Level [dBm]
1 / 2412	802.11g	BPSK	6 Mbps	22.99
6 / 2437	802.11g	BPSK	6 Mbps	24.02
11 / 2462	802.11g	BPSK	6 Mbps	19.14
1 / 2412	802.11g	16QAM	24 Mbps	22.97
6 / 2437	802.11g	16QAM	24 Mbps	24.17
11 / 2462	802.11g	16QAM	24 Mbps	19.14

2.5. WLAN Test results

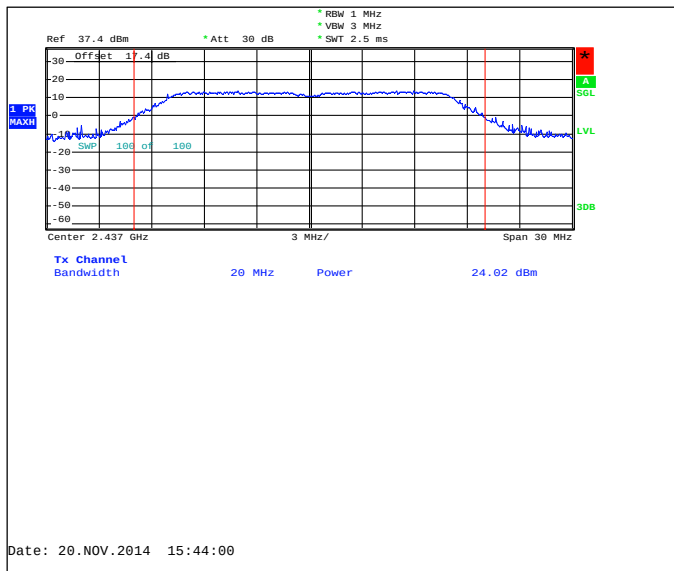
2.5.1 802.11g mode, BPSK modulation, 6 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
1 / 2412	22.99	199.067	PASSED
6 / 2437	24.02	252.348	PASSED
11 / 2462	19.14	82.035	PASSED

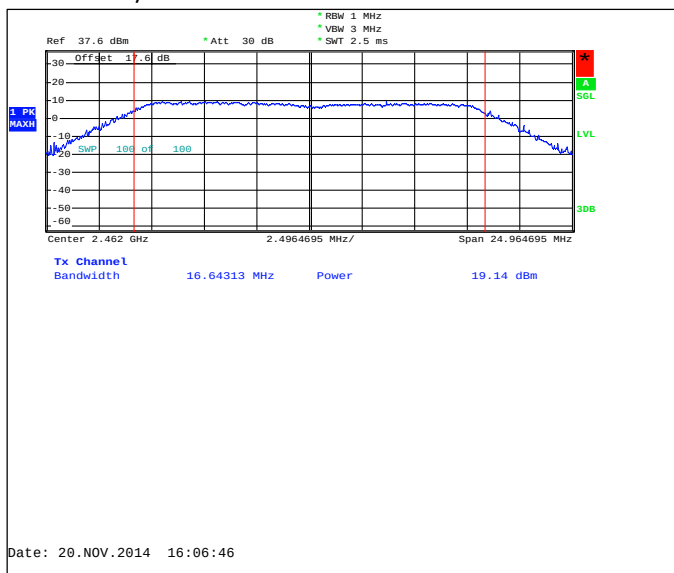
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



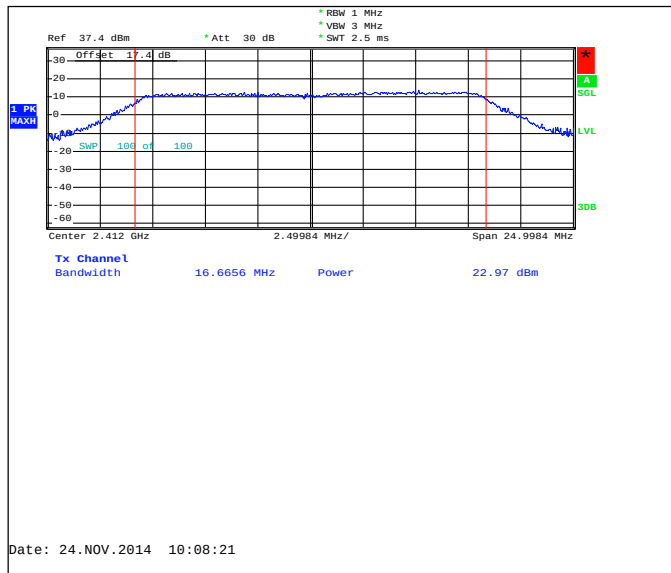
Channel 11 / 2462 MHz



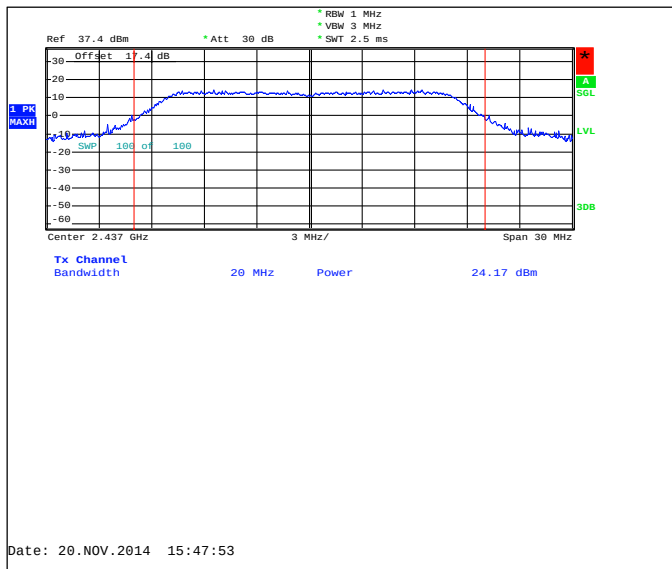
2.5.2 802.11g mode, 16QAM modulation, 24 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [mW]	Result
1 / 2412	22.97	198.153	PASSED
6 / 2437	24.17	261.216	PASSED
11 / 2462	19.14	82.035	PASSED

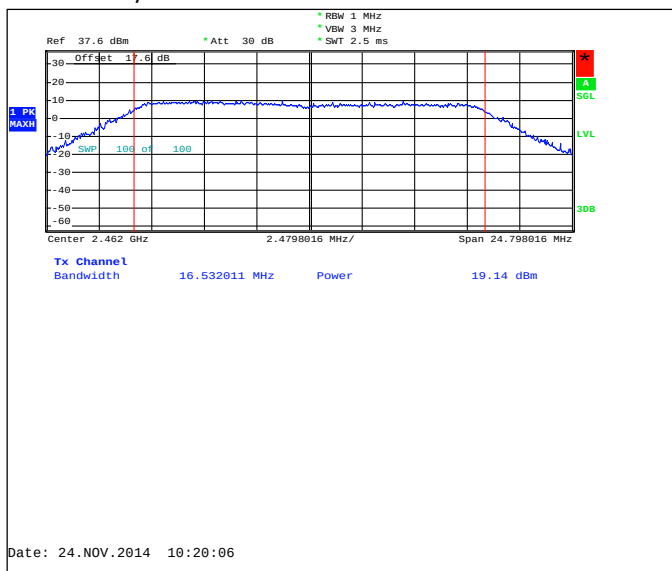
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



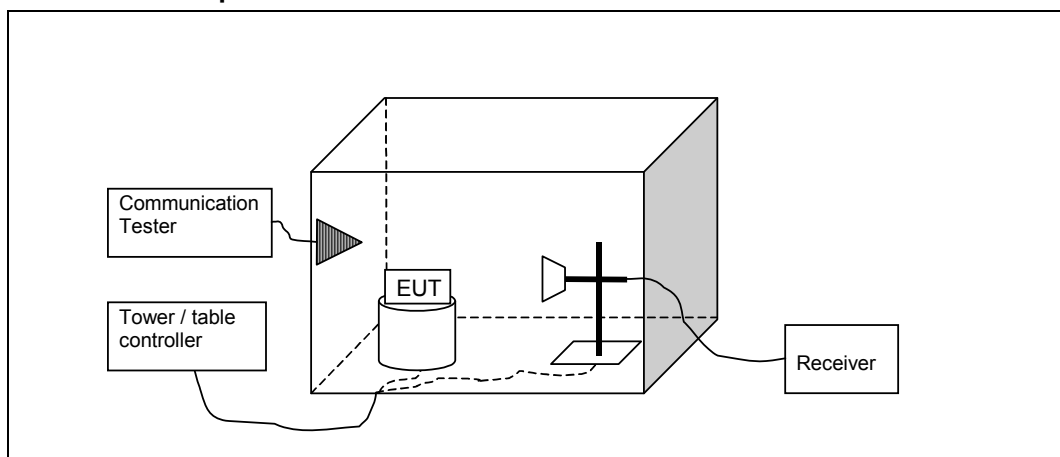
Channel 11 / 2462 MHz



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

EUT with DUT number	RM-1072, DUT 43234
Accessories with DUT numbers	BV-T5C, DUT 43235 ; AC-20E, DUT 43229 ; WH-108, DUT 43230
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 38 / 102.5
Date of measurements	27-Nov-2014
Measured by	Timo Raiskio

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 ($A_{TOT} = L_{CABLES} + A_F - G_{PREAMP}$).

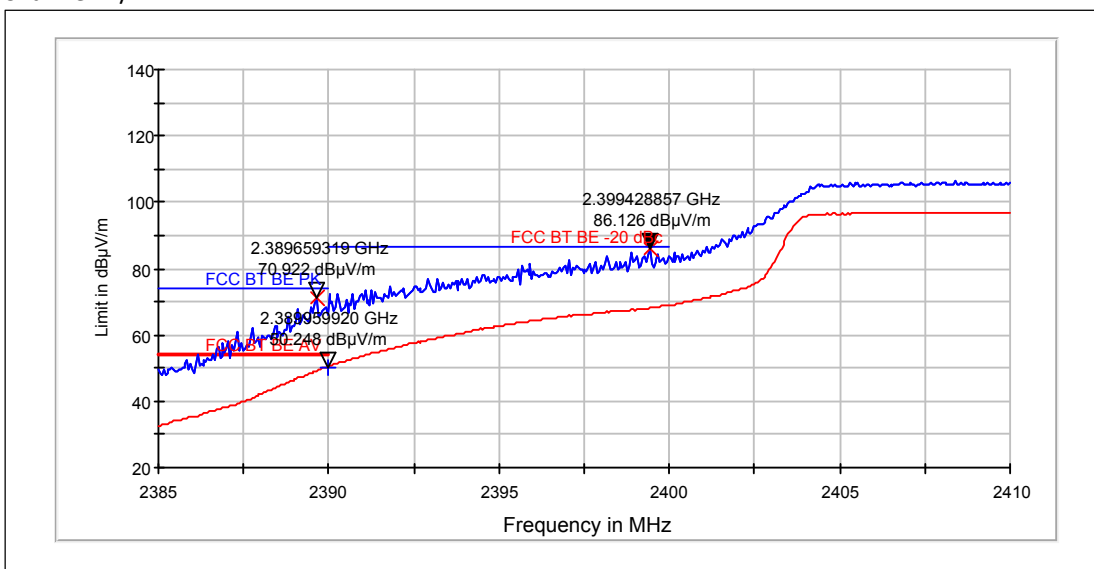
Limits for band edge compliance of RF emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit
Below 2390 and above 2483.5	54 dBuV/m (avg) and 74 dBuV/m (pk)
2390 - 2400	-20 dBc (pk)

3.3. WLAN test results

3.3.1 802.11n, BPSK modulation, 6.5 / 7.25 Mbps data rate.

Channel 1 / 2412 MHz



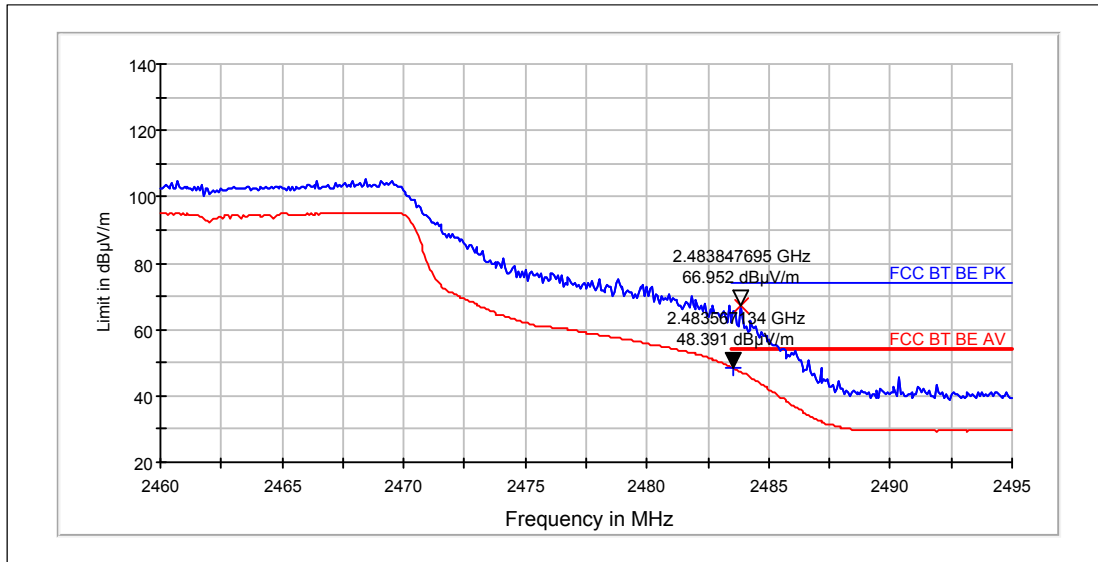
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2390	70.92	3516.414	80.71	-9.79	PASSED
2399	86.13	20244.171	95.92	-9.79	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2390	50.25	325.387	60.04	-9.79	PASSED

Channel 11 / 2462 MHz



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

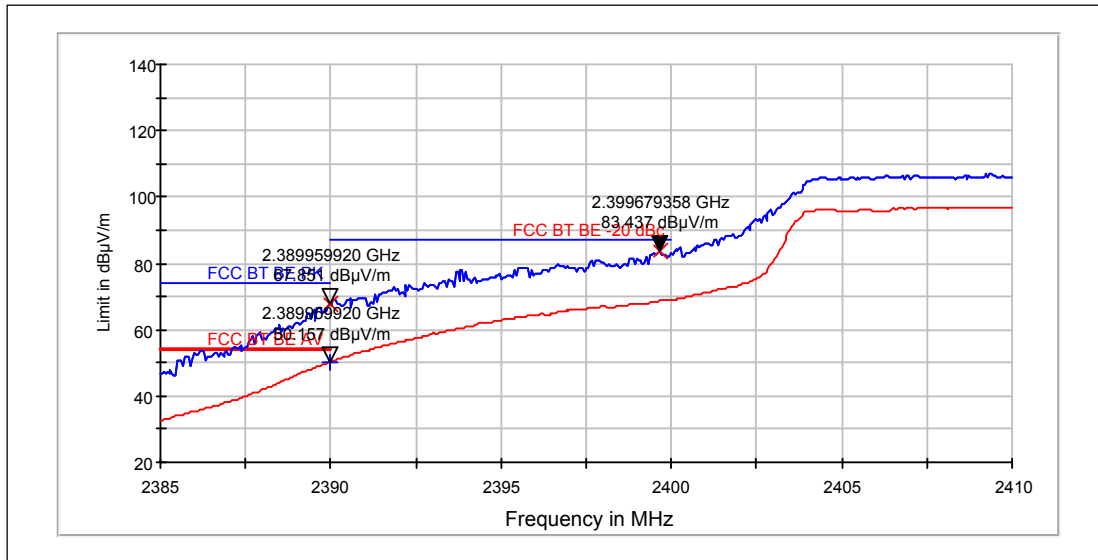
Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2484	66.95	2226.384	76.78	-9.83	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2484	48.39	262.754	58.22	-9.83	PASSED

3.3.2 802.11g, 16QAM modulation, 24 Mbps data rate.

Channel 1 / 2412 MHz



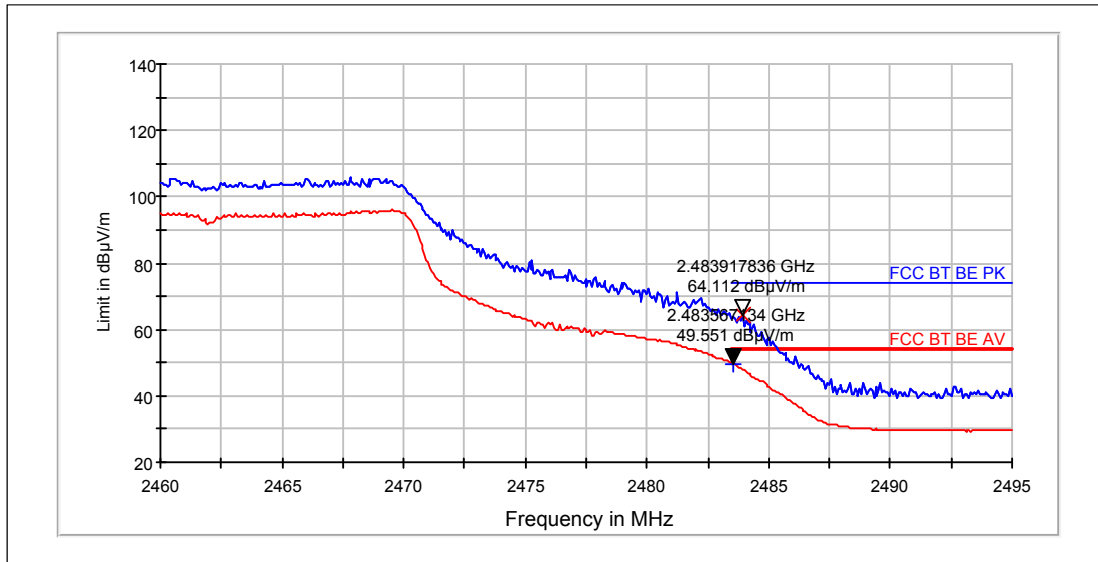
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2390	67.85	2469.164	77.64	-9.79	PASSED
2400	83.44	14854.225	93.23	-9.79	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2390	50.16	321.996	59.95	-9.79	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]	Results
2484	64.11	1605.462	73.94	-9.83	PASSED

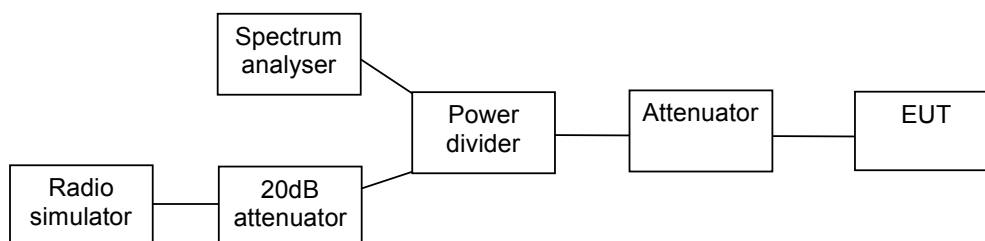
Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Results
2484	49.55	300.296	59.38	-9.83	PASSED

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

EUT with DUT number	RM-1072, DUT 43231
Accessories with DUT numbers	BV-T5C DUT 43232, AC-20E DUT43140, WH-108 DUT43213
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 38 / 102
Date of measurements	24-Nov-2014
Measured by	Hannu Söderholm

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.

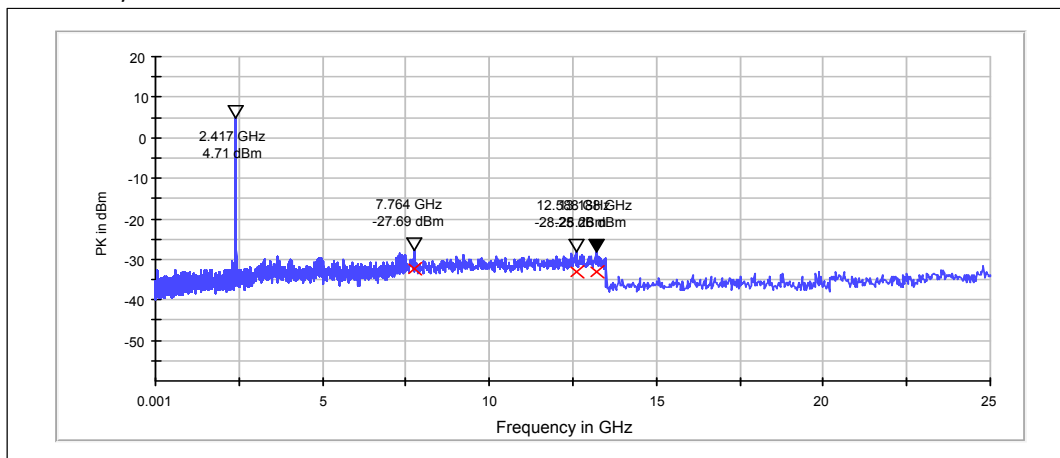
Limits for spurious RF conducted emissions measurements

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

4.3. WLAN Test results

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

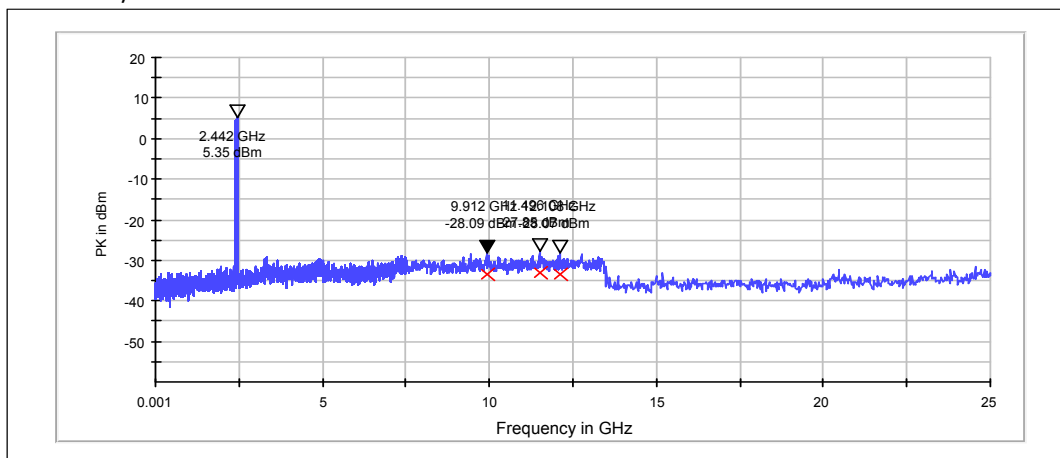
Channel 1 / 2412 MHz



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

Frequency [MHz]	P [dBc]	Result
7764.000	-32.40	PASSED
12588.000	-32.96	PASSED
13188.000	-32.96	PASSED

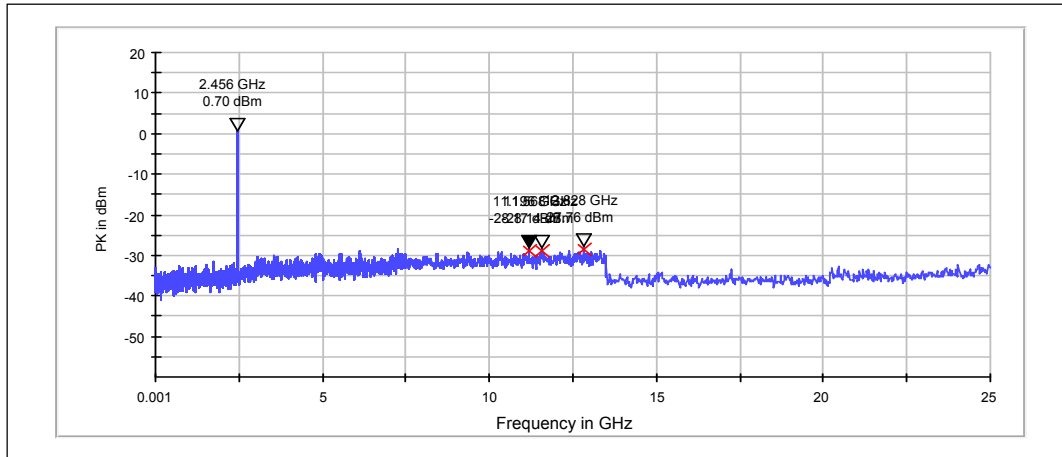
Channel 6 / 2437 MHz



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

Frequency [MHz]	P [dBc]	Result
11496.000	-33.20	PASSED
12108.000	-33.42	PASSED
9912.000	-33.44	PASSED

Channel 11 / 2462 MHz

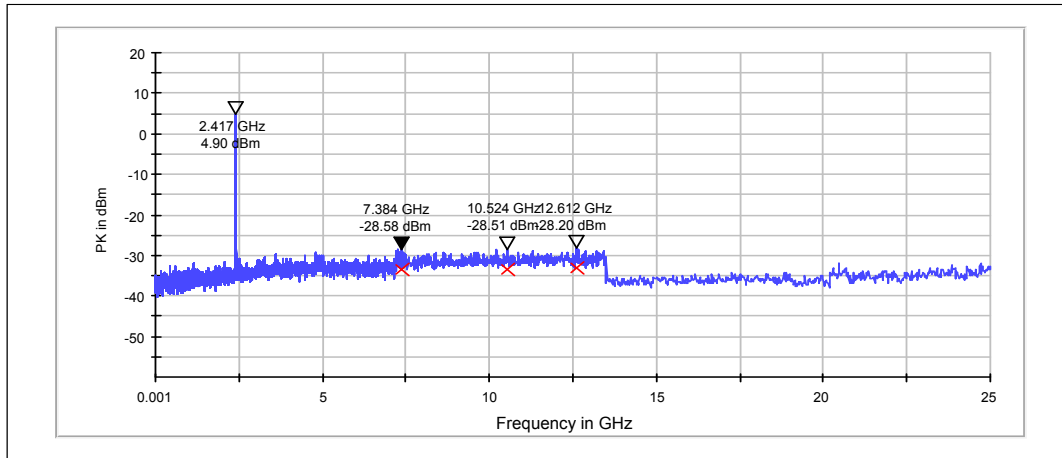


Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
12828.000	-28.45	PASSED
11568.000	-28.83	PASSED
11196.000	-28.87	PASSED

4.3.2 802.11g mode, 16QAM modulation, 24 Mbps data rate

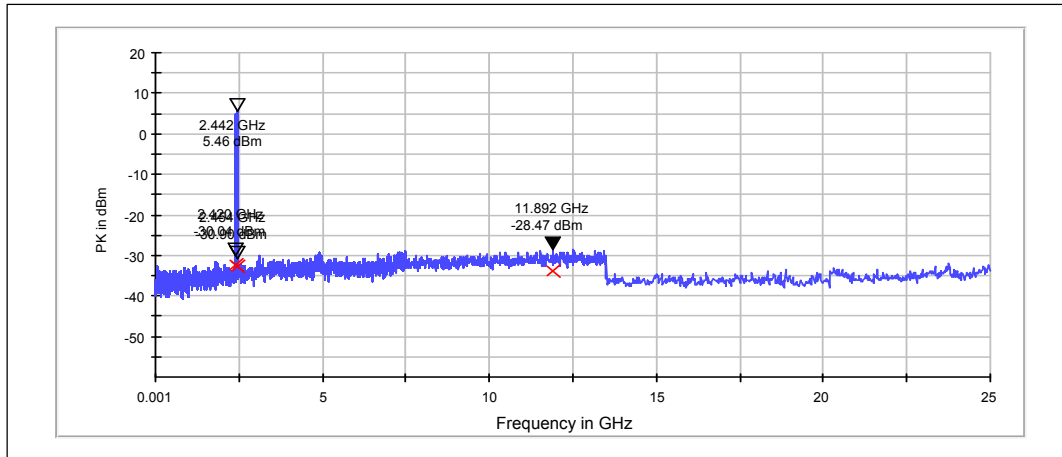
Channel 1 / 2412 MHz



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

Frequency [MHz]	P [dBc]	Result
12612.000	-33.10	PASSED
10524.000	-33.41	PASSED
7384.200	-33.48	PASSED

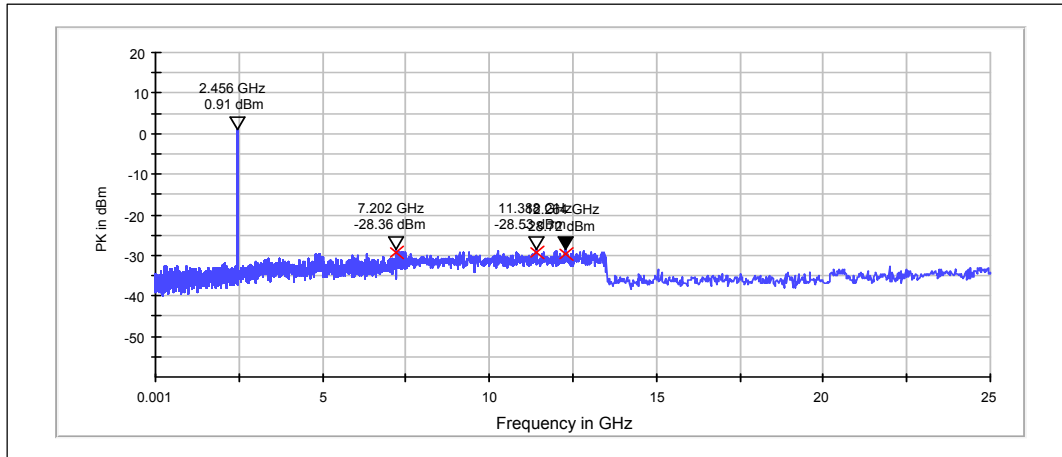
Channel 6 / 2437 MHz



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

Frequency [MHz]	P [dBc]	Result
2420.335	-32.21	PASSED
2453.665	-32.64	PASSED
11892.000	-33.92	PASSED

Channel 11 / 2462 MHz



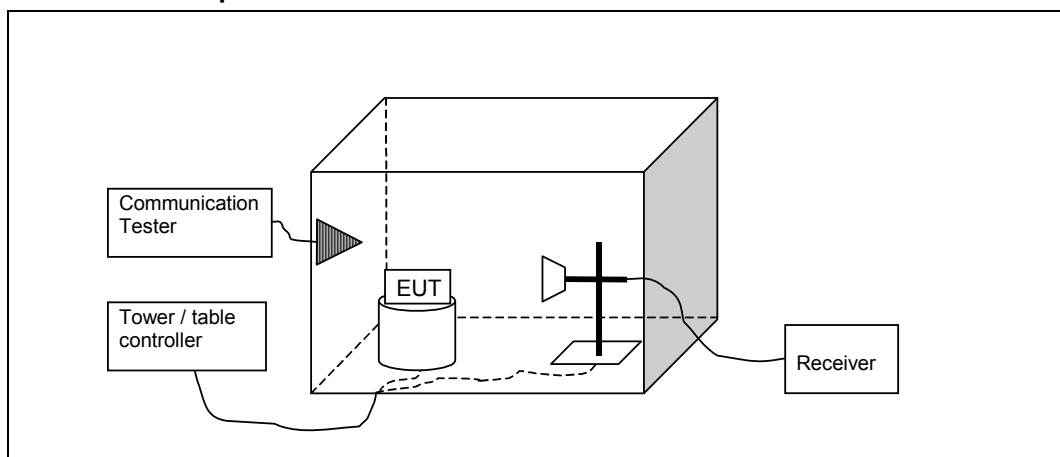
Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
7201.800	-29.27	PASSED
11388.000	-29.44	PASSED
12264.000	-29.63	PASSED

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

EUT with DUT number	RM-1072, DUT 43234
Accessories with DUT numbers	BV-T5C, DUT 43235 ; AC-20E, DUT 43229 ; WH-108, DUT 43230
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 38 / 102.5
Date of measurements	27-Nov-2014
Measured by	Timo Raiskio

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.
The measurement is made up to 10th harmonic of the EUT highest TX channel.

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

5.3. WLAN test results

5.3.1 802.11g mode, 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	40.71	108.518	45.41	-4.7	74	33.27	PASSED
7235.4	49.52	299.226	48.62	0.9	95	45.71	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	27.94	24.946	32.64	-4.7	54	26.04	PASSED
7235.4	34.56	53.456	33.66	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
35.668	28.24	25.823	51.24	-23	40	11.76	PASSED
35.692	28.66	27.102	51.66	-23	40	11.34	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
4880.4	42.39	131.674	46.59	-4.2	74	31.59	PASSED
7318.9	47.19	228.823	45.89	1.3	74	26.79	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
4880.4	28.66	27.102	32.86	-4.2	54	25.32	PASSED
7318.9	33.37	46.612	32.07	1.3	54	20.61	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
4923.2	46.76	217.771	50.86	-4.1	74	27.22	PASSED
7386.6	46.11	202.069	44.61	1.5	74	27.87	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
4923.2	32.45	41.928	36.55	-4.1	54	21.53	PASSED
7386.6	32.76	43.451	31.26	1.5	54	21.22	PASSED

5.3.2 802.11g, 16QAM modulation, 24 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
4825.3	41.45	118.168	46.05	-4.6	74	32.53	PASSED
7234	47.42	234.963	46.52	0.9	95	47.81	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
4825.3	28.37	26.212	32.97	-4.6	54	25.61	PASSED
7234	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
35.698	28.6	26.915	51.6	-23	40	11.4	PASSED
36.622	29.64	30.339	53.04	-23.4	40	10.36	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
4881.2	42.03	126.328	46.23	-4.2	74	31.95	PASSED
7319.9	46.31	206.776	45.01	1.3	74	27.67	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
4881.2	28.66	27.102	32.86	-4.2	54	25.32	PASSED
7319.9	32.99	44.617	31.69	1.3	54	20.99	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
4924.9	45.44	187.068	49.54	-4.1	74	28.54	PASSED
7387.2	46.1	201.837	44.6	1.5	74	27.88	PASSED

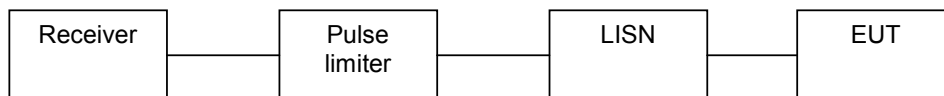
Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
4924.9	32.05	40.041	36.15	-4.1	54	21.93	PASSED
7387.2	32.86	43.954	31.36	1.5	54	21.12	PASSED

6. AC powerline conducted emissions (FCC §15.207, RSS-210 7.2.4)

EUT with DUT number	RM-1072, DUT 43238
Accessories with DUT numbers	BV-T5C, DUT 43235 ; AC-20E, DUT 43229 ; WH-108, DUT 43230
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 40 / 99.4
Date of measurements	12-Dec-2014
Measured by	Timo Raiskio

6.1. Test Setup



6.2. Test method and limit

The measurement is made according to procedure KDB 558074 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.

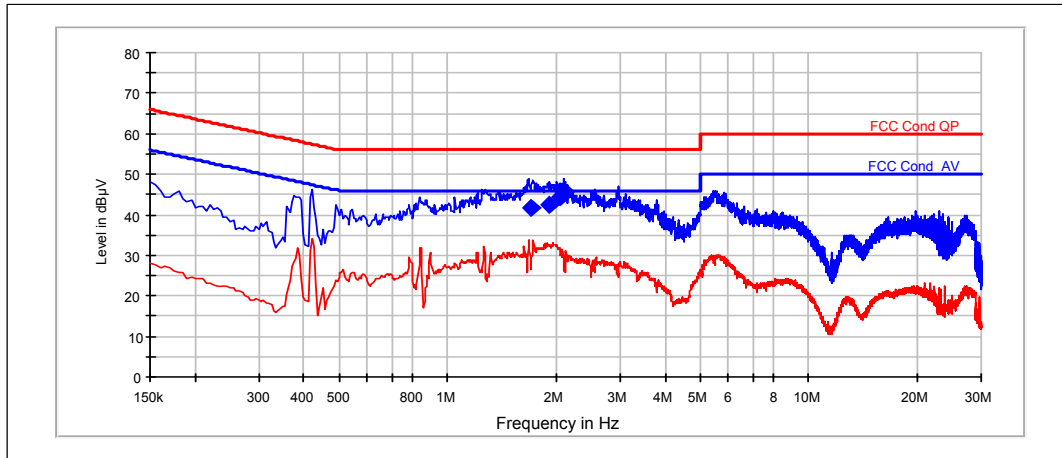
CISPR 22 Class B limits

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

6.3. WLAN Test results

6.3.1 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 6 / 2437 MHz

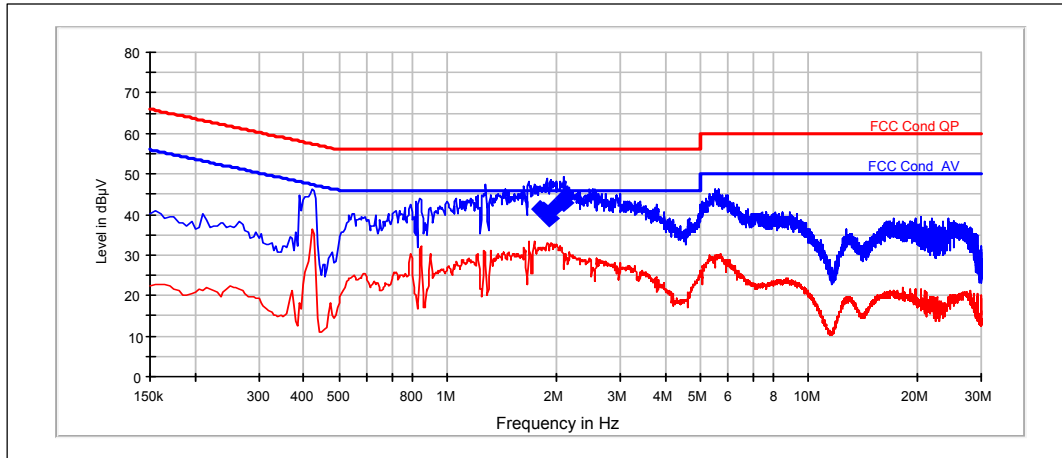


QuasiPeak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
1.705	41.58	N	PASSED
1.915	42.29	L1	PASSED
2.045	44.22	L1	PASSED
2.09	45.46	L1	PASSED
2.1	45.84	L1	PASSED

6.3.2 OFDM mode, 16-QAM modulation, 24 Mbps data rate

Channel 6 / 2437 MHz



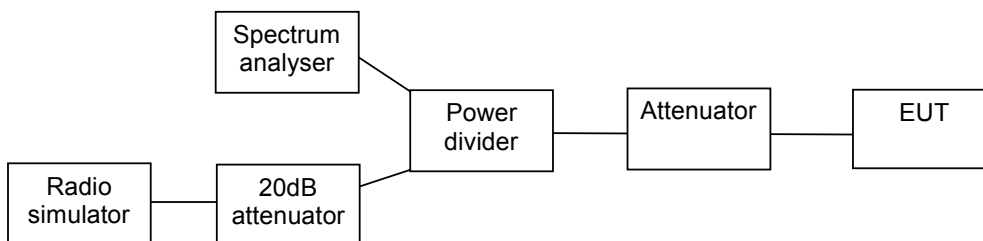
QuasiPeak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
1.81	41.42	L1	PASSED
1.85	40.95	L1	PASSED
1.905	39.07	N	PASSED
1.975	41.87	L1	PASSED
2.085	42.8	L1	PASSED
2.1	44.12	L1	PASSED

7. 6dB(bandwidth) (FCC §15.247(a)(2), RSS-210 A8.2(a))

EUT with DUT number	RM-1072, DUT 43231
Accessories with DUT numbers	BV-T5C DUT 43232, AC-20E DUT43140, WH-108 DUT43213
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 38 / 102
Date of measurements	24-Nov-2014
Measured by	Hannu Söderholm

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 6 dB bandwidth measurements

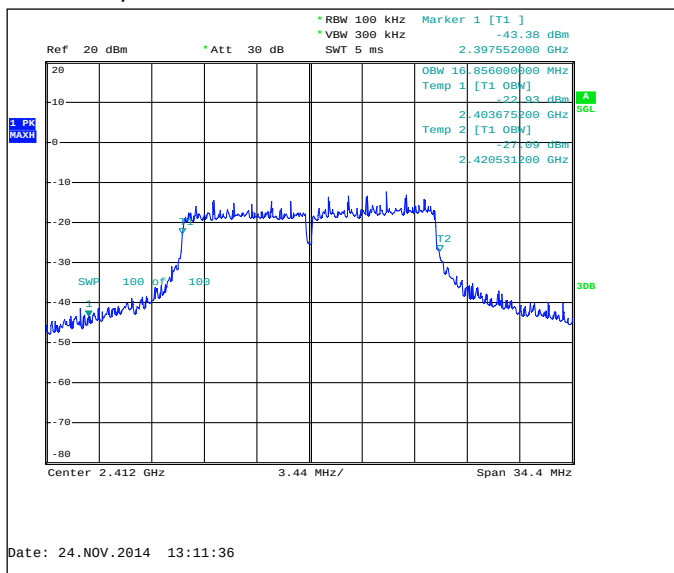
Limit [kHz]
>= 500

7.3. WLAN Test results

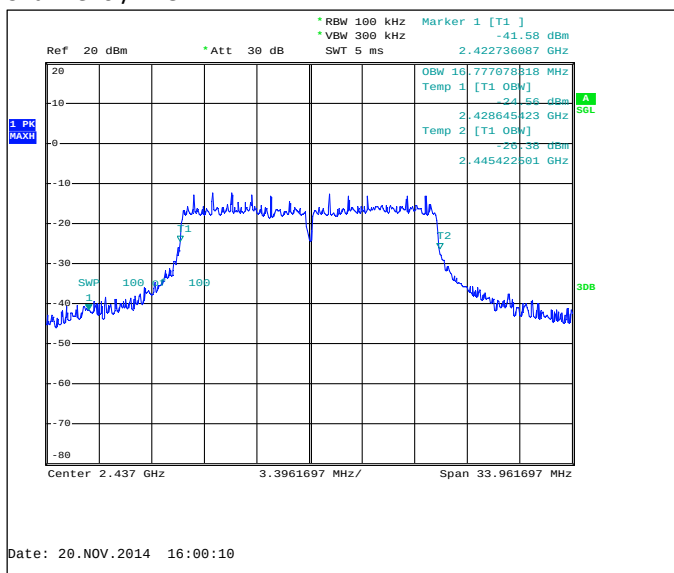
7.3.1 802.11g mode, BPSK modulation, 6 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	16856	PASSED
6 / 2437	16777.1	PASSED
11 / 2462	16643.1	PASSED

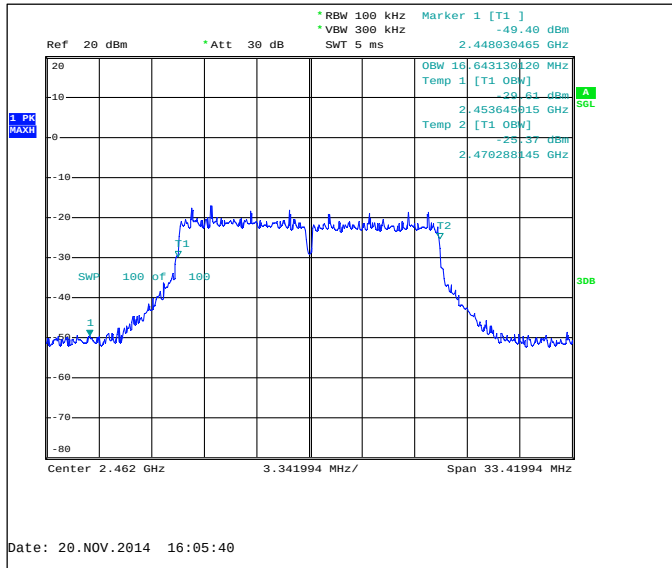
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



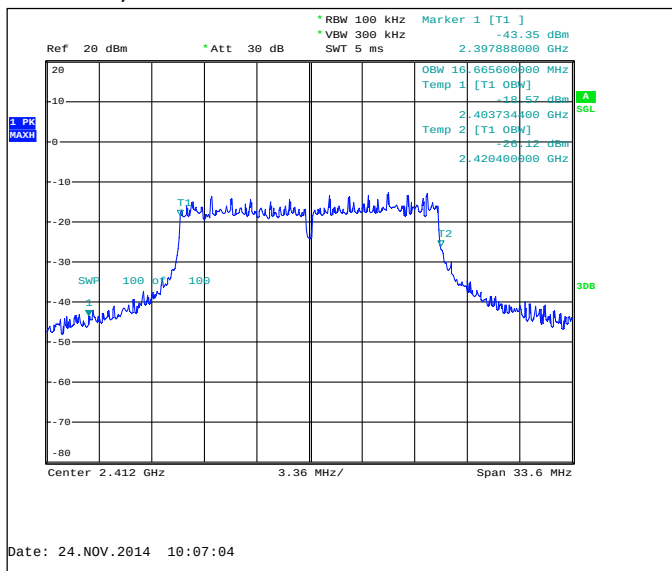
Channel 11 / 2462 MHz



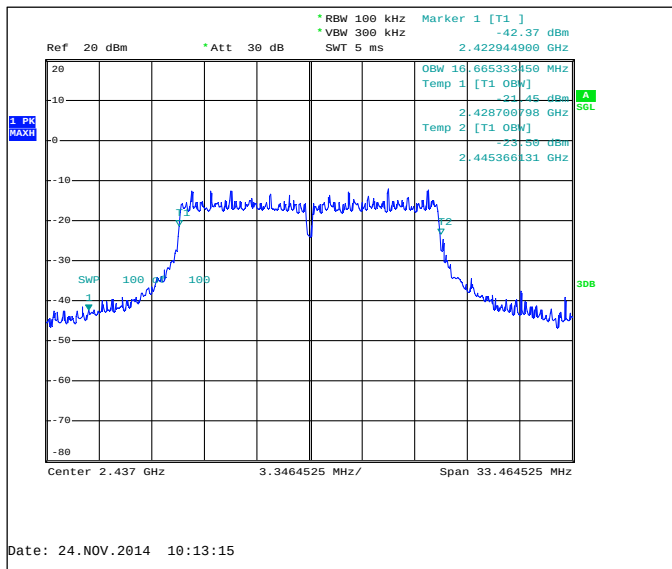
7.3.2 802.11g mode, 16QAM modulation, 24 Mbps data rate

Channel / fc [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	16665.6	PASSED
6 / 2437	16665.3	PASSED
11 / 2462	16532	PASSED

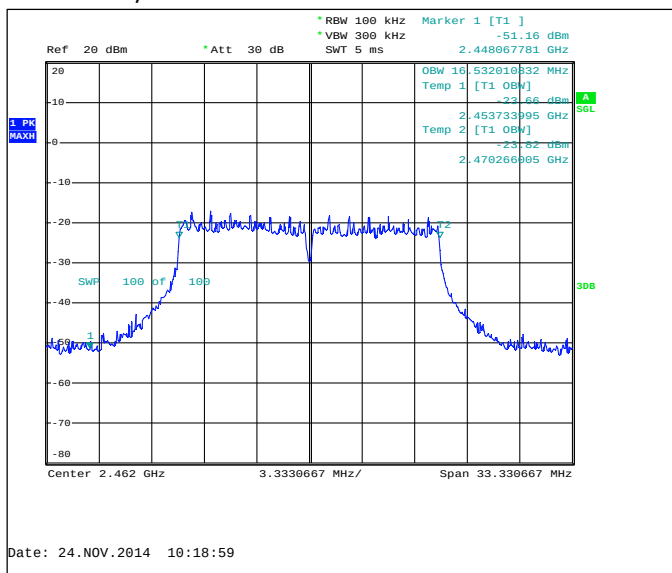
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



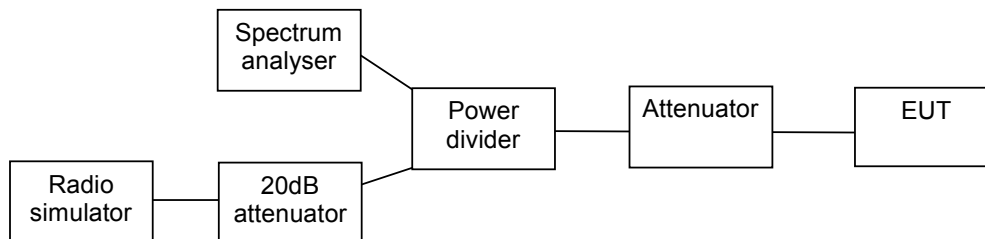
Channel 11 / 2462 MHz



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

EUT with DUT number	RM-1072, DUT 43231
Accessories with DUT numbers	BV-T5C DUT 43232, AC-20E DUT43140, WH-108 DUT43213
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 38 / 102
Date of measurements	24-Nov-2014
Measured by	Hannu Söderholm

8.1. Test Setup



8.2. 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

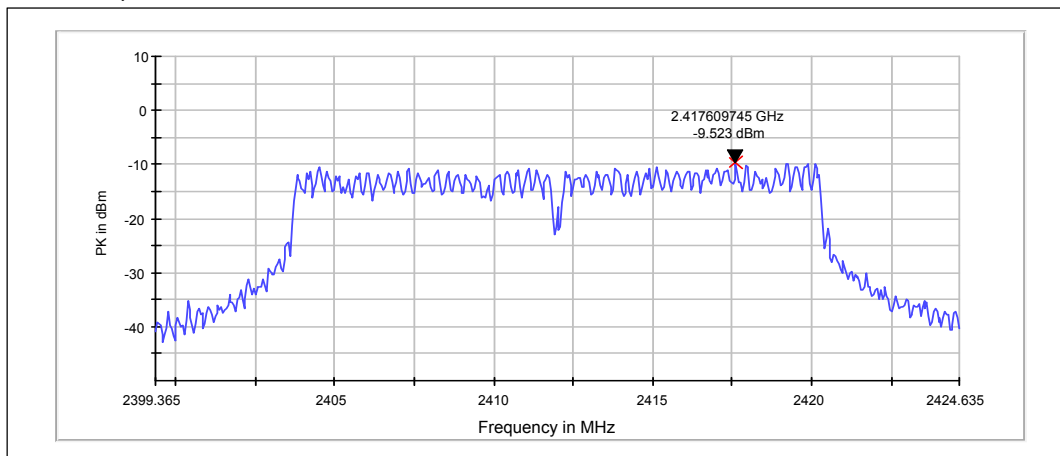
8.3. WLAN Test results

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

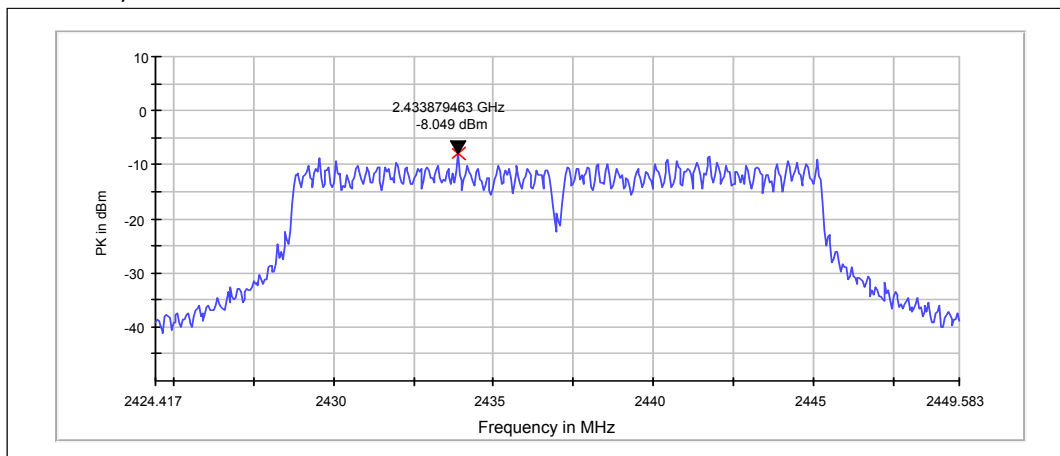
Peak (RBW: 3 kHz, VBW: 10 kHz, Max hold)

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-9.52	PASSED
6 / 2437	-8.05	PASSED
11 / 2462	-14.11	PASSED

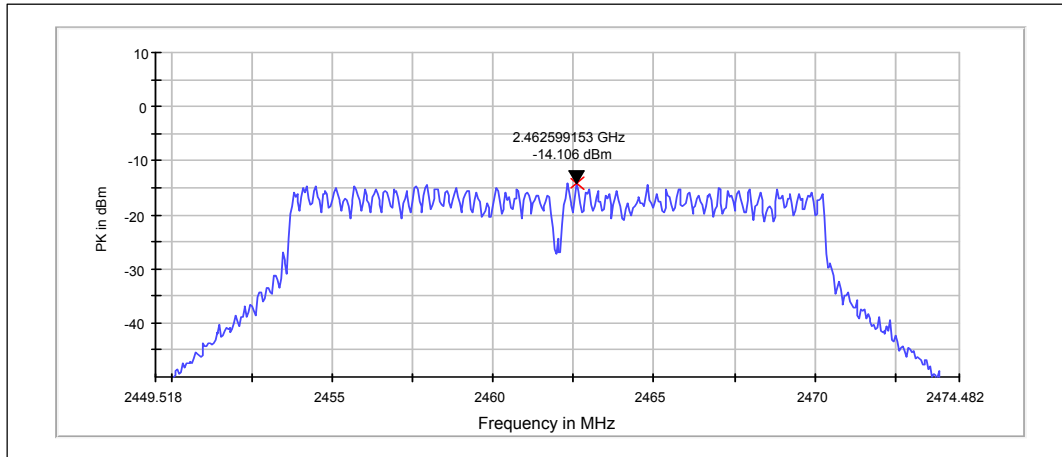
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



Channel 11 / 2462 MHz

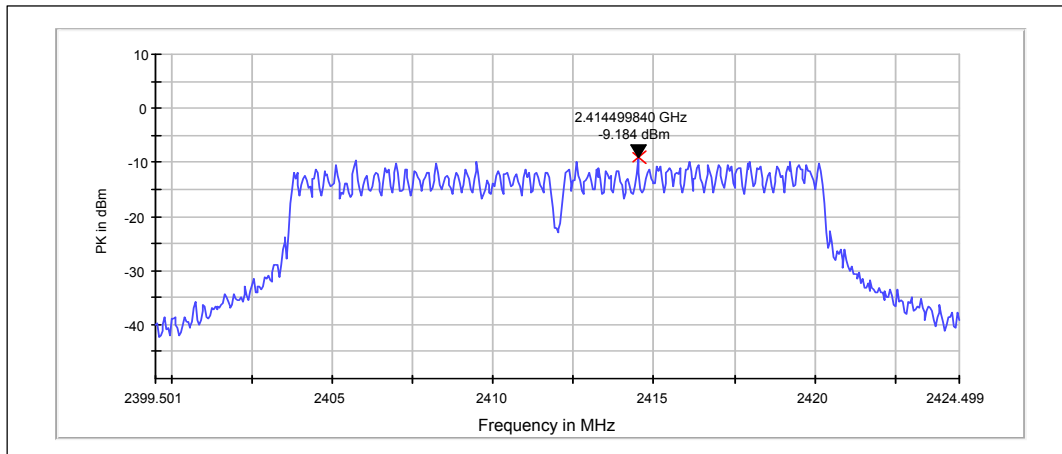


8.3.2 802.11g mode, 16QAM modulation, 24 Mbps data rate

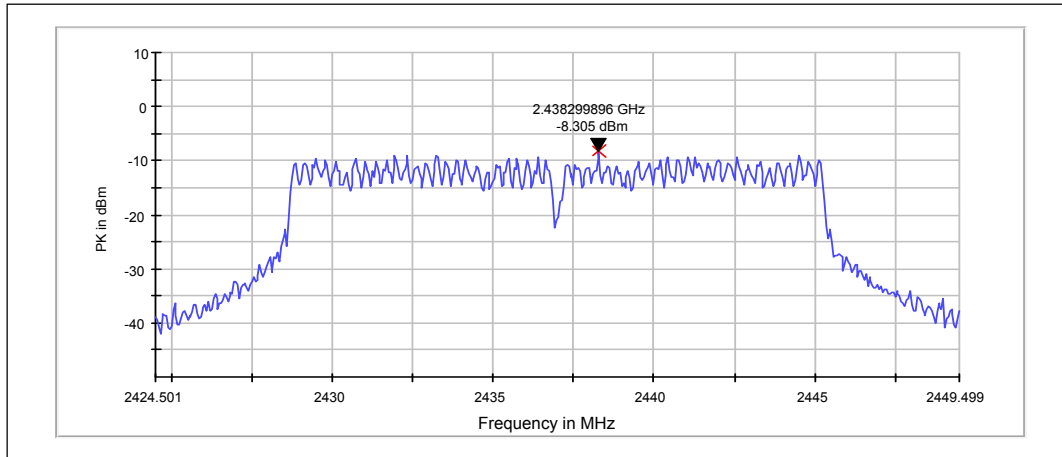
Peak (RBW: 3 kHz, VBW: 10 kHz, Max hold)

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-9.18	PASSED
6 / 2437	-8.3	PASSED
11 / 2462	-12.81	PASSED

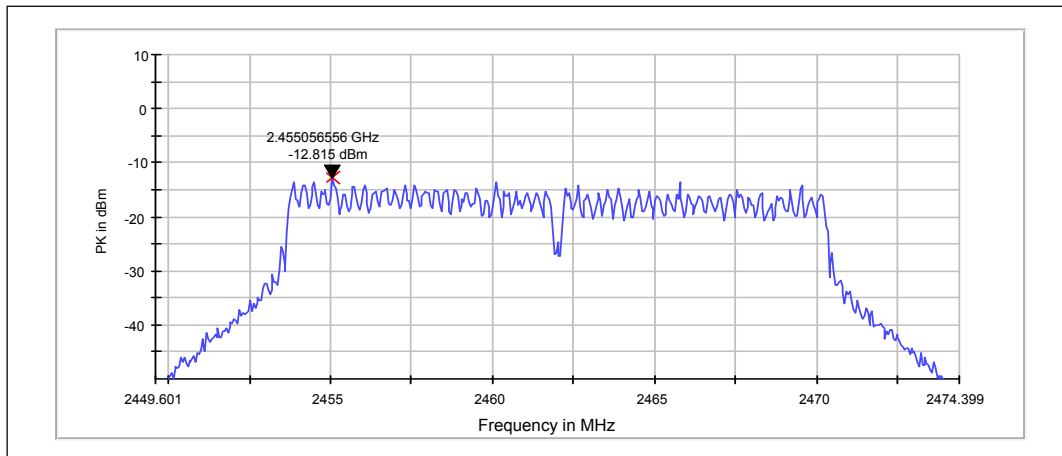
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



Channel 11 / 2462 MHz



9. Test Equipment

9.1. 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

9.2. 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
-	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