

## FCC Part 15C Compliance Test Report

<b>Test Report no.:</b>	FCC15CWLAN_RM-1150_06.docx	<b>Date of Report:</b>	02-Dec-2015
<b>Number of pages:</b>	80	<b>Customer's Contact person:</b>	Juha Paukku
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<b>FCC listing no.:</b>	94436		
<b>IC recognition no.:</b>	661AK-1		
<b>Tested devices/ accessories:</b>	<b>Phone RM-1150 / Charger AC-18E / Battery BV-T3G (LG) / Headset WH-108 / Dummy battery SD-134</b>		
<b>FCC ID:</b>	PYARM-1150	<b>IC:</b>	
<b>Supplement reports:</b>	-		
<b>Testing has been carried out in accordance with:</b>	<b>47 CFR 15C, ANSI C63.10 (2013), RSS-247 (Issue 1) and RSS-Gen (Issue 4). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".</b>		
<b>Documentation:</b>	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.		
<b>Test Results:</b>	<b>The EUT complies with the requirements in respect of all parameters subject to the test.</b> The test results relate only to devices specified in this document		
<b>Date and signature for the contents:</b>			

Hannu Söderholm, Engineer, EMC

## 1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	21-Oct-2015
Testing completed	28-Oct-2015
The customer's contact person	Juha Paukku
Test Plan referred to	T:\Projects\RM-1152\TestPlan\Test_plan_EMCC_FCC_RM-1152.xlsx
Notes	-
Document name	T:\Projects\RM-1150\EMC\COPY reports\FCC15CWLAN_RM-1150_06.docx

### 1.1. EUT and Accessory Information

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-1152	004402742963899	1540	-	01078.10006.15421.42000	400052
Charger	AC-18E	4090493521750501701;0675695	-	-	-	400050
Battery	BV-T3G (LG)	4955405343010304094;0670783	1.0	-	-	400051
Headset	WH-108	-	4.0	4.0	-	42927
Dummy battery	SD-134	2301637	v.1	-	-	400053

EUT antenna gain

Gain [dBi]	2400-2483.5 MHz
Antenna 1	0
Antenna 2	-

### 1.2. Summary of Test Results

WLAN:

Section in CFR 47	Section in RSS-GEN or RSS-247	Name of the test	Result
15.247(b)(1)	5.4 (4)	Conducted peak output power	PASSED
15.247(d), 15.205(b)	5.5	Band edge compliance of RF emissions	PASSED
15.247(d)	5.5	Spurious RF conducted emissions	PASSED
15.247(d), 15.209	5.5	Spurious radiated emissions	PASSED
15.207	8.8	AC powerline conducted emissions	PASSED
15.247(a)(2)	5.2 (1)	6 dB bandwidth	PASSED
15.247(e)	5.2 (2)	Power spectral density	PASSED

The test results of RM-1152 are re-used for certification of the RM-1150. The table above indicates the results, which will be re-used.

PASSED  
 FAILED  
 NP

The EUT complies with the essential requirements in the standard.  
 The EUT does not comply with the essential requirements in the standard.  
 The test was not performed by the TCC Microsoft Laboratory.

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## 2. Test mode selection

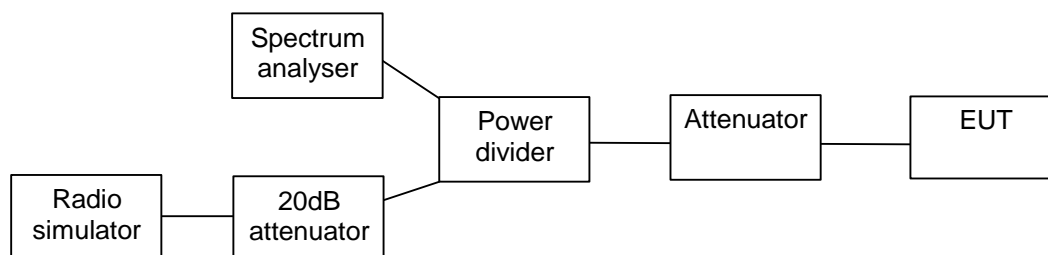
RF output power was measured with every data rate on middle channel. The data rate with highest RF power was further measured on edge channels. The selection was done separately amongst BPSK data rates and QPSK family (QPSK, 16QAM, 64QAM, 256QAM) data rates.

The selected data rates were further used in all other tests as worst case.

### 3. Conducted peak output power

<b>EUT with DUT number</b>	RM-1152, DUT 400052
<b>Accessories with DUT numbers</b>	SD-134, DUT 400053
<b>Operation Voltage [V] / [Hz]</b>	Nominal
<b>Results</b>	PASSED
<b>Remarks</b>	RF Cond 2
<b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b>	22 / 45 / 100
<b>Date of measurements</b>	27-Oct-2015
<b>Measured by</b>	Hannu Soderholm

#### 3.1. Test Setup



#### 3.2. Test method and limit

The measurement is made according to ANSI C63.10 and RSS-247.

Limits for conducted peak output power measurements

Frequency range [MHz]	Limit [W]	Limit [dBm]	IC only Limit [dBm eirp]
2400 – 2483.5	1	30	36

### 3.3. Power results summary, All data speeds

Channel / fc [MHz]	Mode	Modulation	Data rate	Level [dBm]
6 / 2437	802.11b Main	BPSK	1 Mbps	18.75
6 / 2437	802.11b Main	QPSK	2 Mbps	18.94
6 / 2437	802.11b Main	QPSK	5.5 Mbps	20.71
6 / 2437	802.11b Main	QPSK	11 Mbps	22.24
6 / 2437	802.11g Main	BPSK	6 Mbps	23.47
6 / 2437	802.11g Main	BPSK	9 Mbps	23.44
6 / 2437	802.11g Main	QPSK	12 Mbps	23.12
6 / 2437	802.11g Main	QPSK	18 Mbps	23.23
6 / 2437	802.11g Main	16QAM	24 Mbps	23.6
6 / 2437	802.11g Main	16QAM	36 Mbps	23.31
6 / 2437	802.11g Main	16QAM	48 Mbps	22.33
6 / 2437	802.11g Main	16QAM	54 Mbps	21.82
6 / 2437	802.11n Main	BPSK	6.5 / 7.25 Mbps	22.67
6 / 2437	802.11n Main	QPSK	13.0 / 14.4 Mbps	22.42
6 / 2437	802.11n Main	QPSK	19.5 / 21.7 Mbps	22.4
6 / 2437	802.11n Main	16QAM	26.0 / 28.9 Mbps	22.93
6 / 2437	802.11n Main	16QAM	39.0 / 43.3 Mbps	21.95
6 / 2437	802.11n Main	64QAM	52.0 / 57.8 Mbps	21.45
6 / 2437	802.11n Main	64QAM	58.5 / 65.0 Mbps	21.02
6 / 2437	802.11n Main	64QAM	65.0 / 72.2 Mbps	19.92
6 / 2437	802.11n Main	BPSK	13.5 / 15.0 Mbps	21.73
6 / 2437	802.11n Main	QPSK	27.0 / 30.0 Mbps	21.57
6 / 2437	802.11n Main	QPSK	40.5 / 45.0 Mbps	21.58
6 / 2437	802.11n Main	16QAM	54.0 / 60.0 Mbps	21.91
6 / 2437	802.11n Main	16QAM	81.0 / 90.0 Mbps	20.83
6 / 2437	802.11n Main	64QAM	108.0 / 120.0 Mbps	20.52
6 / 2437	802.11n Main	64QAM	121.5 / 135.0 Mbps	19.99
6 / 2437	802.11n Main	64QAM	135.0 / 150.0 Mbps	19.05

### 3.4. Power results summary

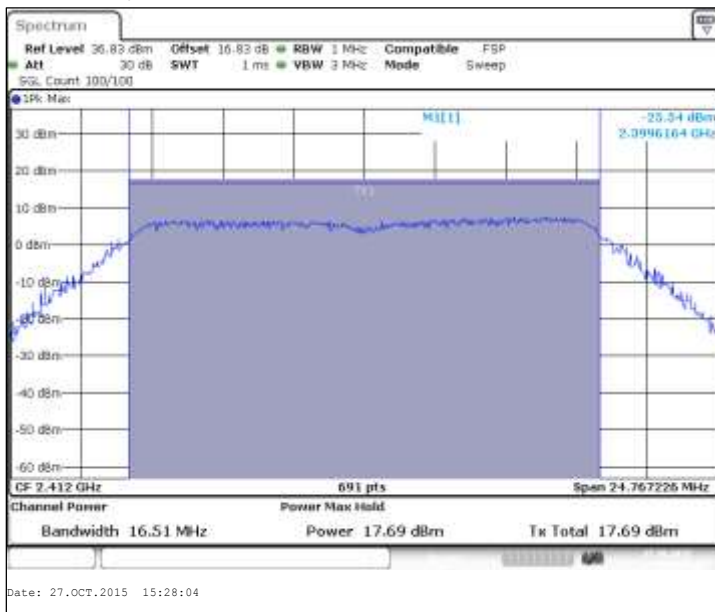
Channel / fc [MHz]	Mode	Modulation	Data rate	Level [dBm]
1 / 2412	802.11g Main	BPSK	6 Mbps	17.69
6 / 2437	802.11g Main	BPSK	6 Mbps	23.47
11 / 2462	802.11g Main	BPSK	6 Mbps	19.35
1-5 / 2422	802.11n Main	BPSK	13.5 / 15.0 Mbps	18.48
6 / 2437	802.11n Main	BPSK	13.5 / 15.0 Mbps	21.73
7-11 / 2452	802.11n Main	BPSK	13.5 / 15.0 Mbps	19.1
1 / 2412	802.11g Main	16QAM	24 Mbps	18.21
6 / 2437	802.11g Main	16QAM	24 Mbps	23.6
11 / 2462	802.11g Main	16QAM	24 Mbps	19.4
1-5 / 2422	802.11n Main	16QAM	54.0 / 60.0 Mbps	18.89
6 / 2437	802.11n Main	16QAM	54.0 / 60.0 Mbps	21.91
7-11 / 2452	802.11n Main	16QAM	54.0 / 60.0 Mbps	19.05

### 3.5. WLAN Test results

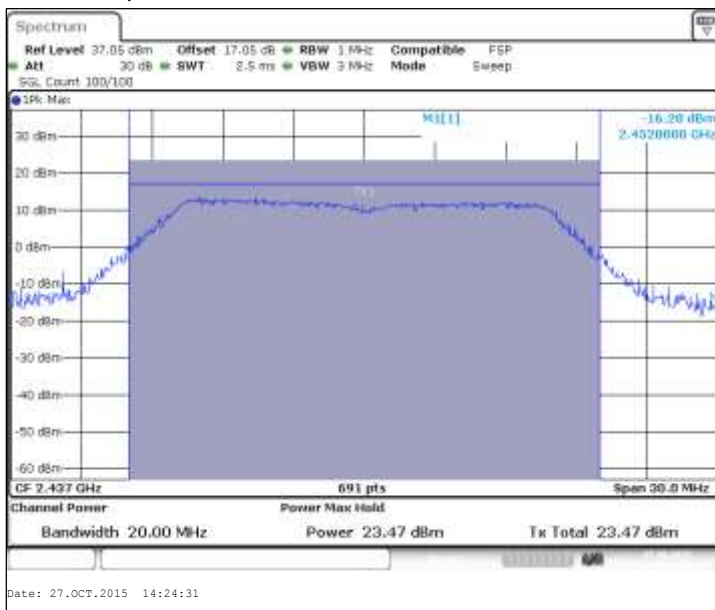
#### 3.5.1 802.11g Main mode, BPSK modulation, 6 Mbps data rate

Channel / f <sub>c</sub> [MHz]	P [dBm]	P [mW]	Result
1 / 2412	17.69	58.749	PASSED
6 / 2437	23.47	222.331	PASSED
11 / 2462	19.35	86.099	PASSED

Channel 1 / 2412 MHz

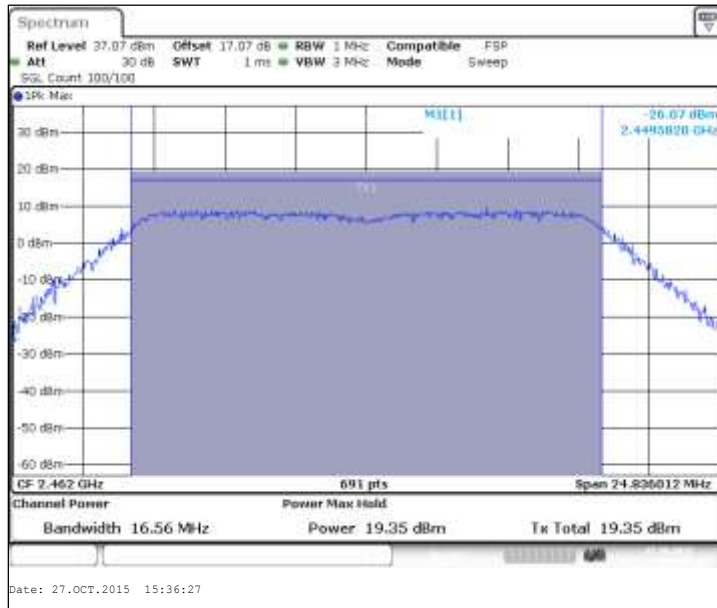


Channel 6 / 2437 MHz





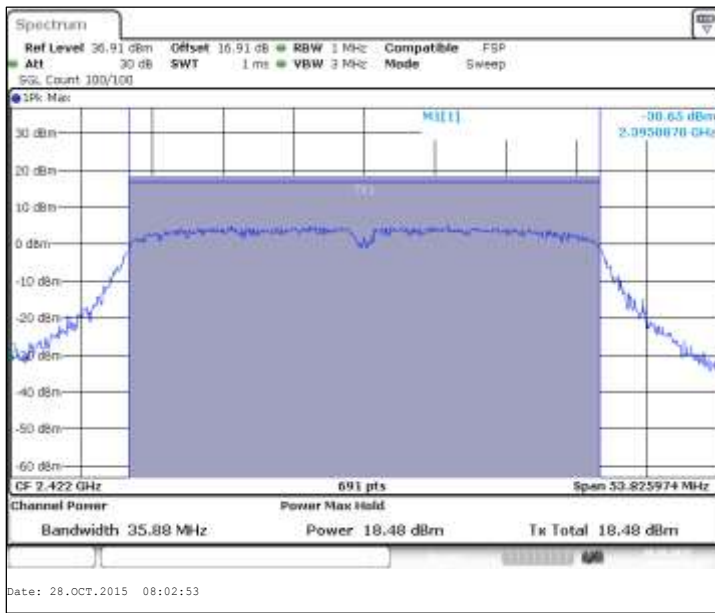
Channel 11 / 2462 MHz



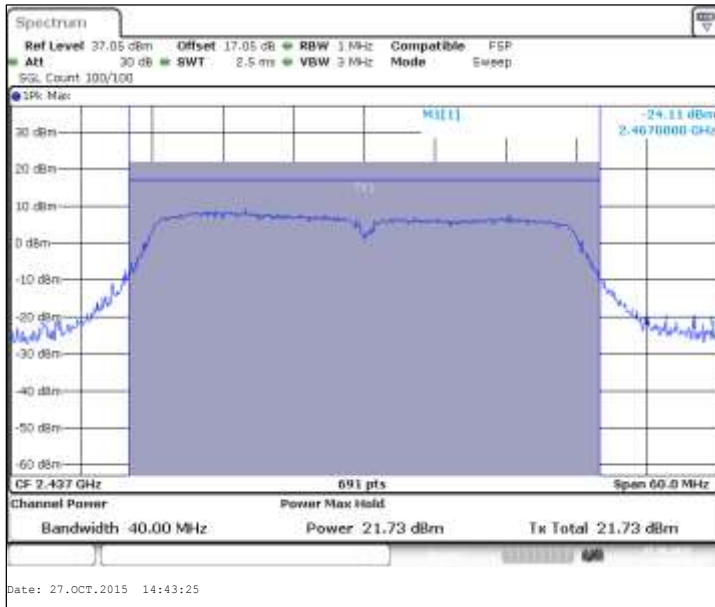
### 3.5.2 802.11n Main mode, BPSK modulation, 13.5 / 15 Mbps data rate

Channel / f <sub>c</sub> [MHz]	P [dBm]	P [mW]	Result
1-5 / 2422	18.48	70.469	PASSED
6 / 2437	21.73	148.936	PASSED
7-11 / 2452	19.1	81.283	PASSED

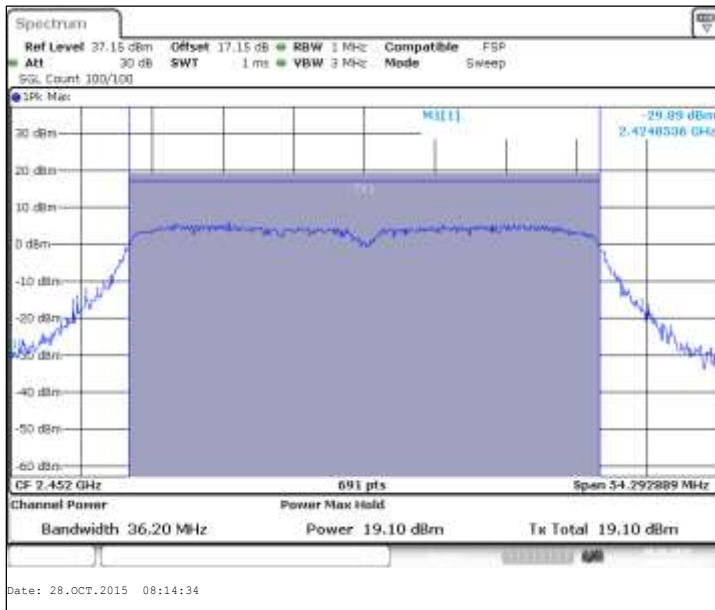
Channel 1-5 / 2422 MHz



Channel 4-8 / 2437 MHz



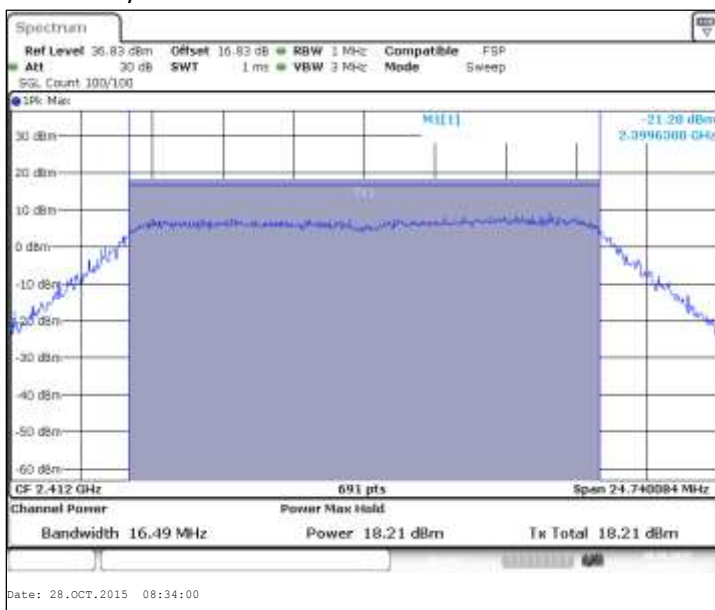
Channel 7-11 / 2452 MHz



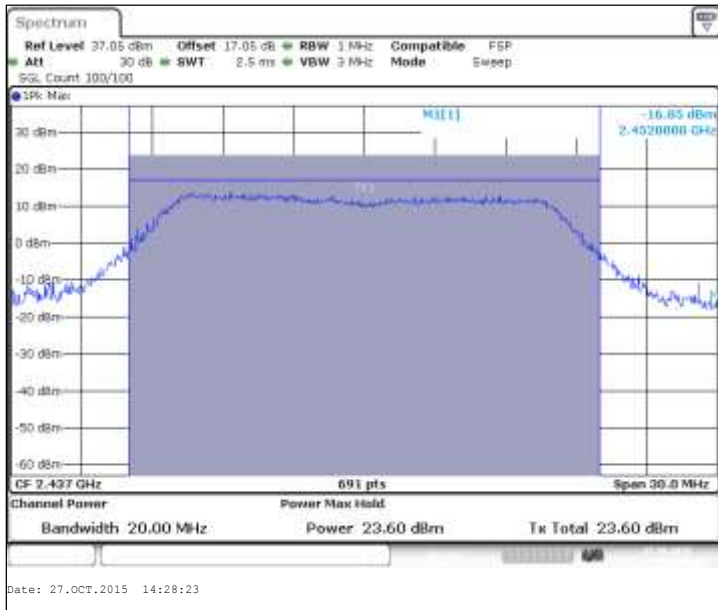
3.5.3 802.11g Main mode, 16QAM modulation, 24 Mbps data rate

Channel / fc [MHz]	P [dBm]	P [mW]	Result
1 / 2412	18.21	66.222	PASSED
6 / 2437	23.6	229.087	PASSED
11 / 2462	19.4	87.096	PASSED

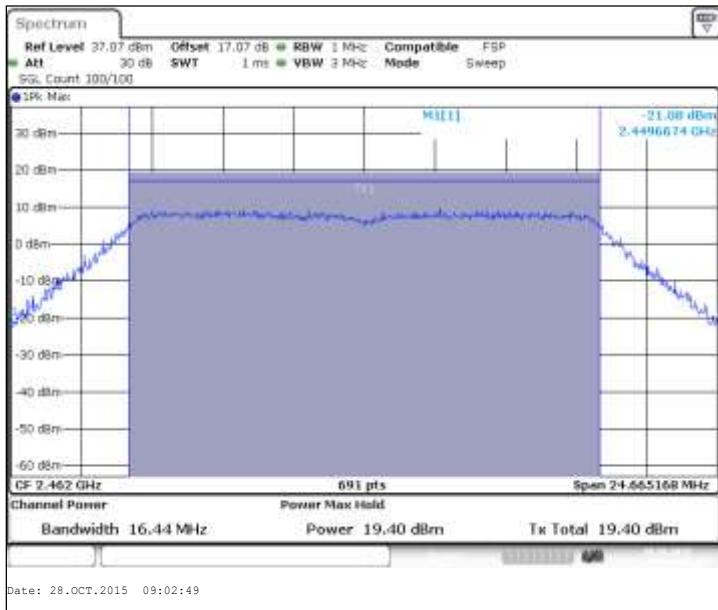
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



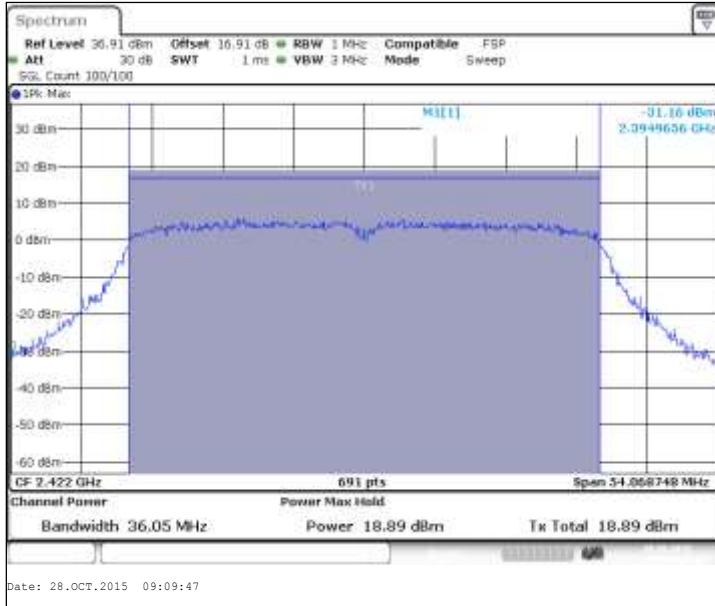
Channel 11 / 2462 MHz



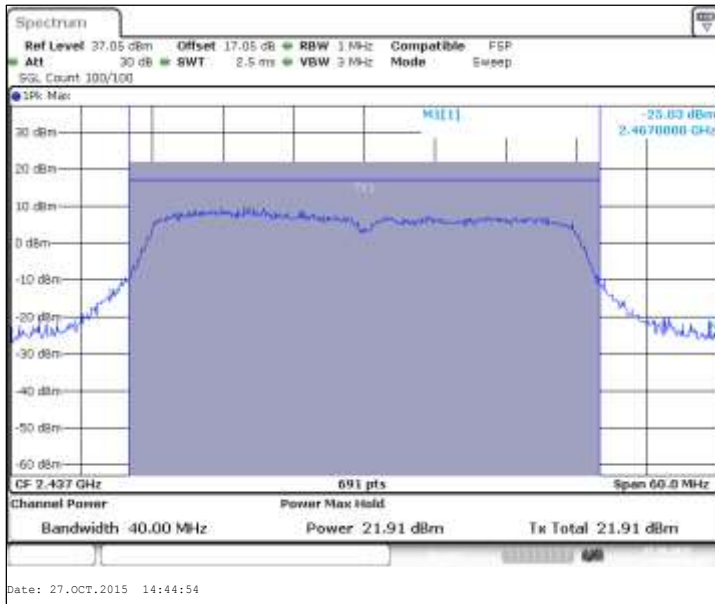
### 3.5.4 802.11n Main mode, 16QAM modulation, 54 / 60 Mbps data rate

Channel / f <sub>c</sub> [MHz]	P [dBm]	P [mW]	Result
1-5 / 2422	18.89	77.446	PASSED
4-8 / 2437	21.91	155.239	PASSED
7-11 / 2452	19.05	80.353	PASSED

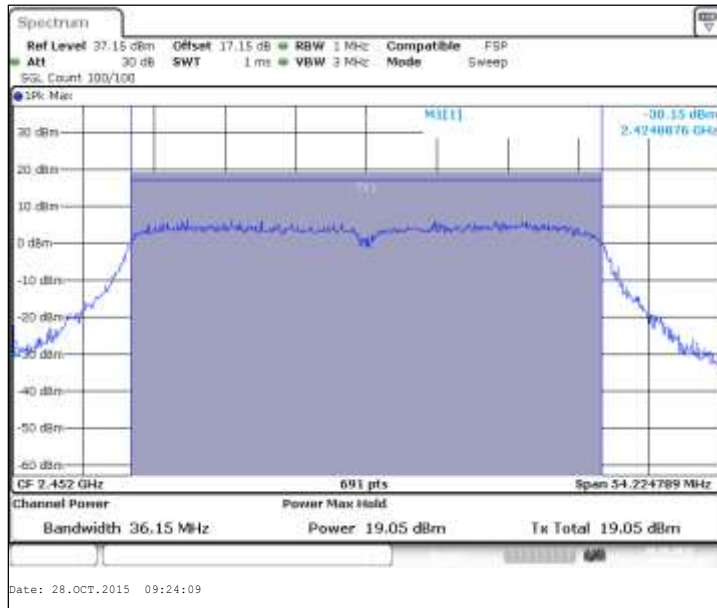
Channel 1-5 / 2422 MHz



Channel 6 / 2437 MHz



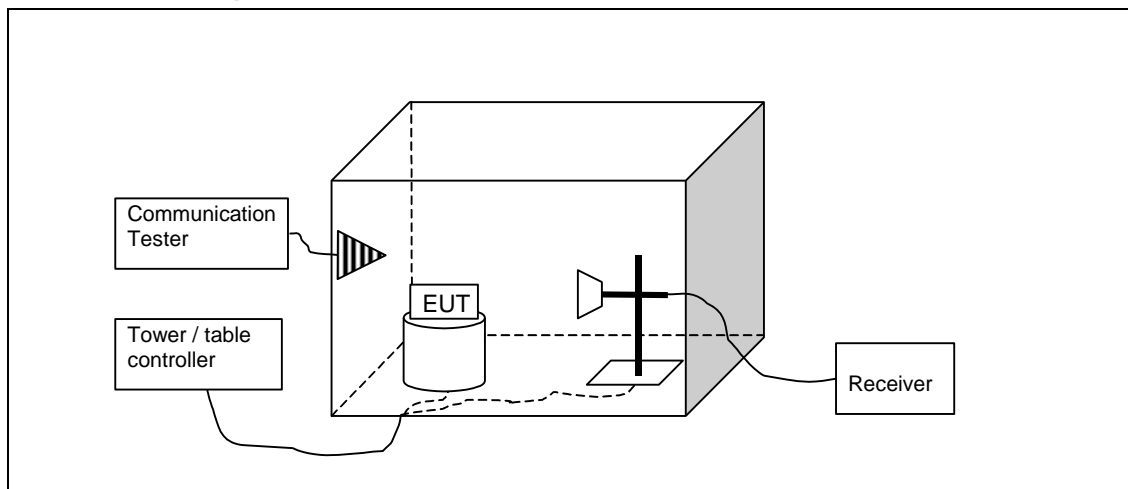
Channel 7-11 / 2452 MHz



## 4. Band edge compliance of RF emissions

<b>EUT with DUT number</b>	RM-1152, DUT 400049
<b>Accessories with DUT numbers</b>	BV-T3G (LG), DUT 400051 ; AC-18E, DUT 400050 ; WH-108, DUT 42927
<b>Operation Voltage [V] / [Hz]</b>	115 / 60
<b>Results</b>	PASSED
<b>Remarks</b>	-
<b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b>	21/40/100
<b>Date of measurements</b>	05-Nov-2015
<b>Measured by</b>	Hannu Söderholm

### 4.1.1 Test setup



### 4.2. Test method and limit

The measurement is made according to ANSI C63.10 and RSS-247 as follows:

The measurement is made with absorbers on the floor, measuring antenna at fixed height in horizontal and vertical polarizations, EUT set in three orthogonal positions on the turn table and turn table rotated 0...360 degrees.

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

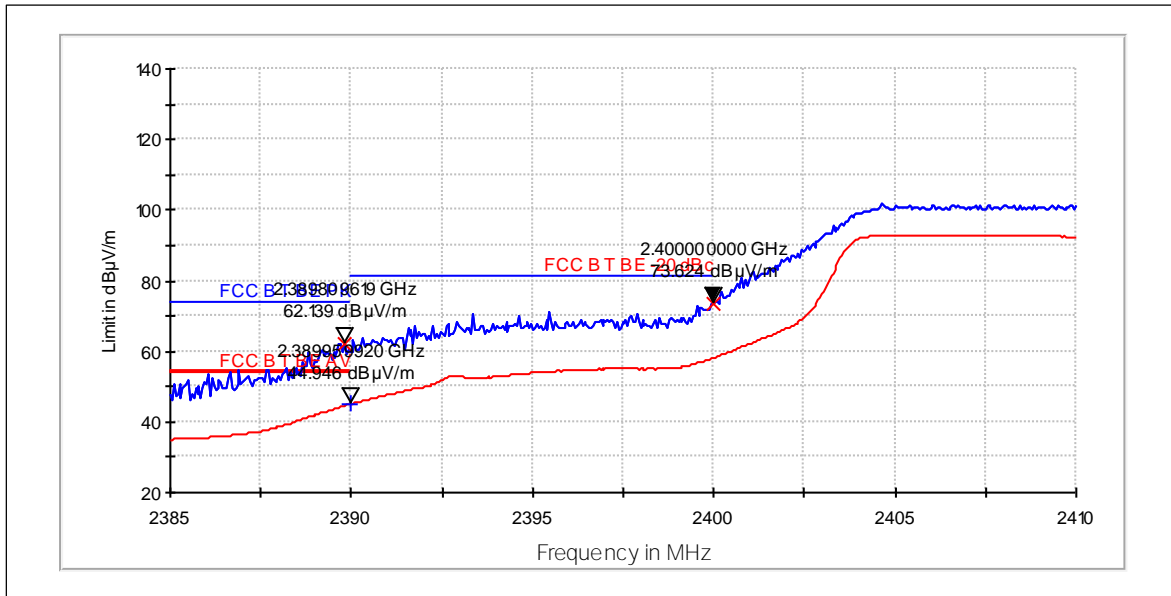
Limits for band edge compliance of RF emissions measurements (3 m measurement distance)

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

### 4.3. WLAN test results, Orthogonal position 1 and 2

#### 4.3.1 802.11g, BPSK modulation, 6 Mbps data rate.

Channel 1 / 2412 MHz



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

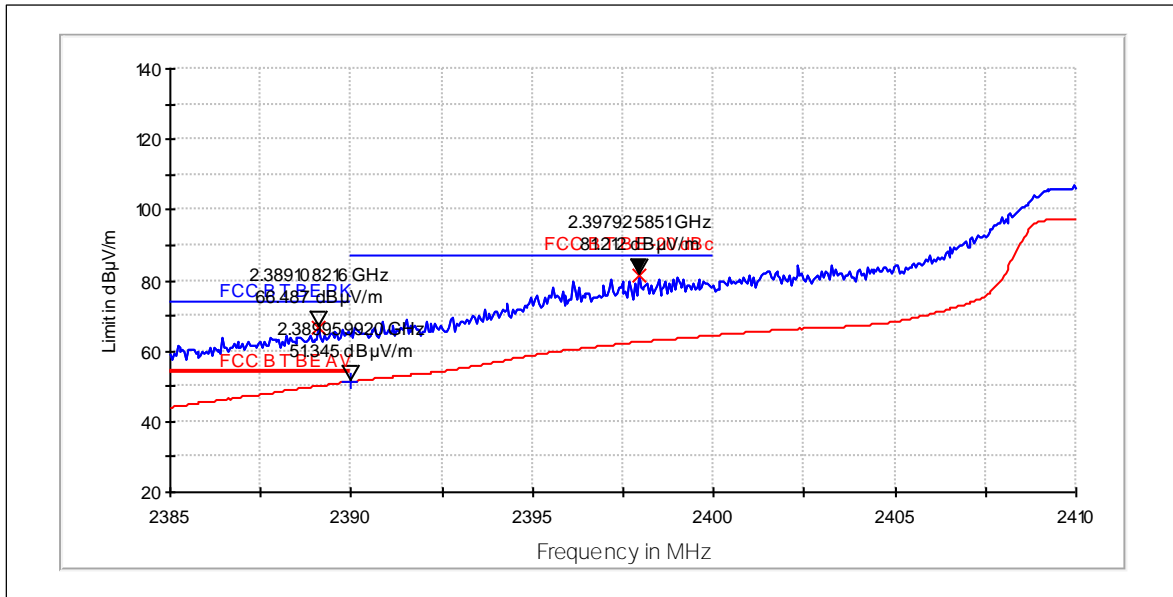
Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	62.14	1279.234	71.69	-9.55	PASSED
2400	73.62	4799.544	83.17	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	44.95	176.726	54.5	-9.55	PASSED



Channel 2 / 2417 MHz



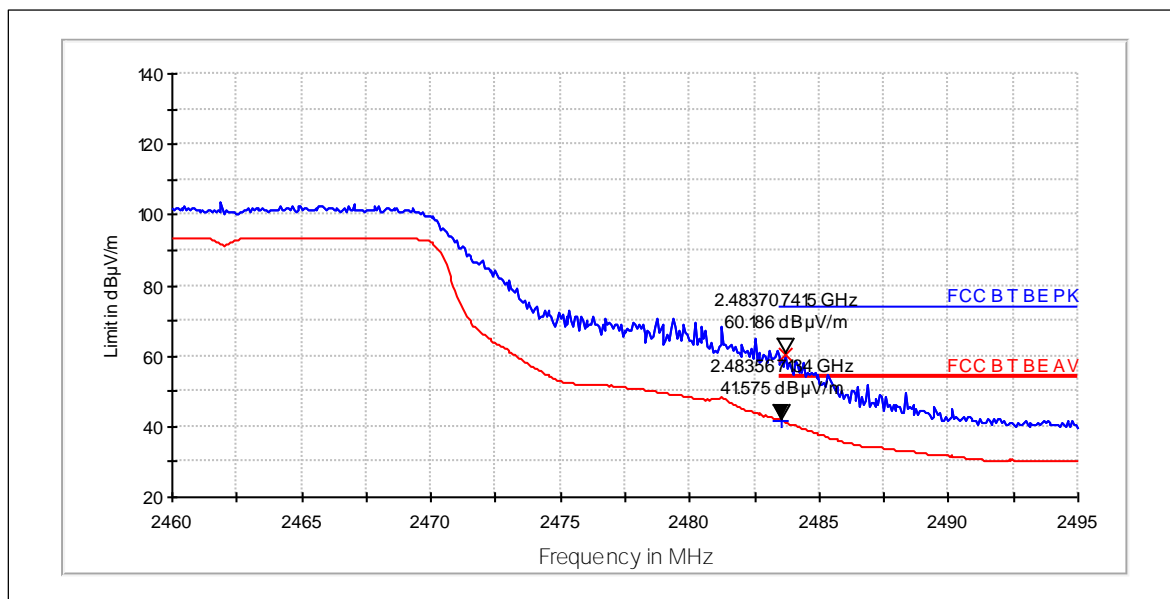
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2389	66.49	2110.328	76.04	-9.55	PASSED
2398	81.21	11497.41	90.76	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	51.35	369.19	60.9	-9.55	PASSED

Channel 11 / 2462 MHz



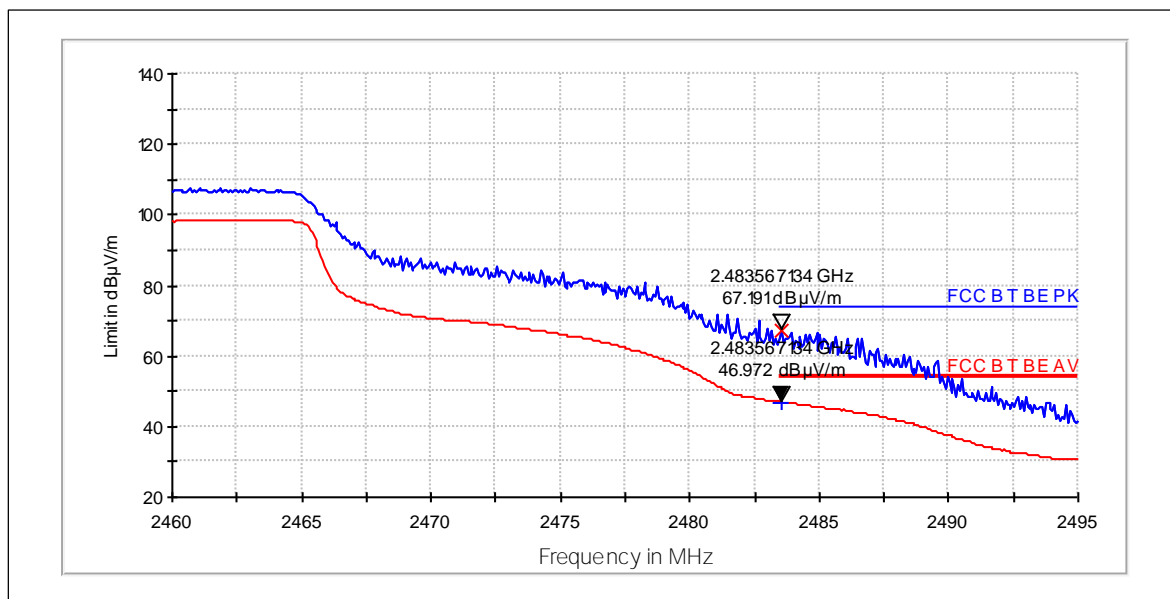
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	60.19	1021.645	69.76	-9.57	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	41.58	119.881	51.15	-9.57	PASSED

Channel 10 / 2457 MHz



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

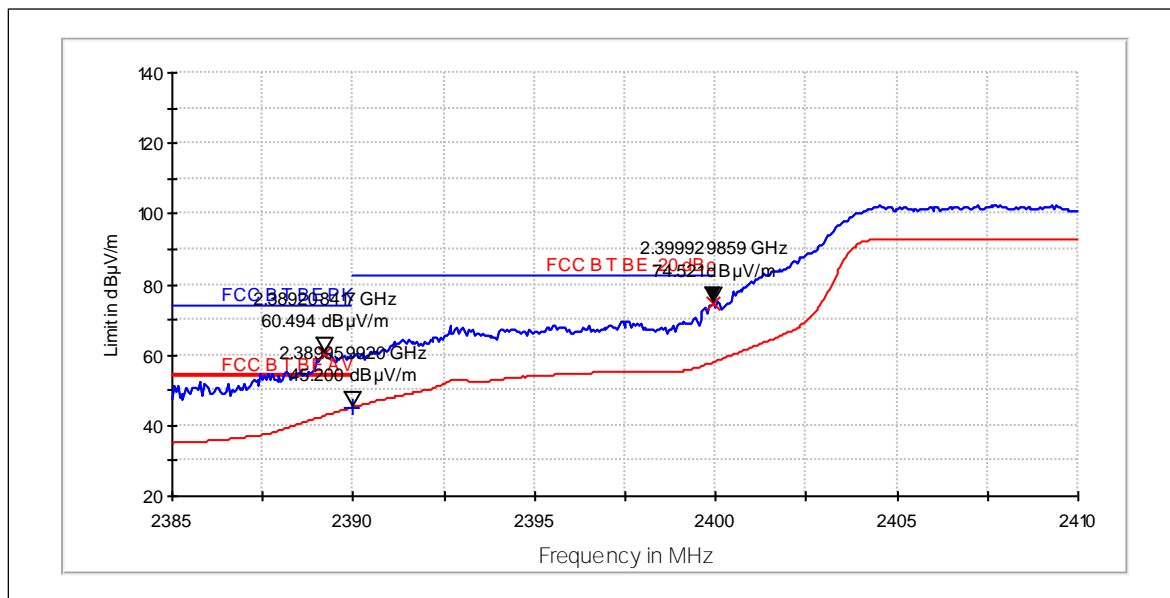
Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	67.19	2288.495	76.76	-9.57	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	46.97	223.152	56.54	-9.57	PASSED

### 4.3.2 802.11g, 16QAM modulation, 24 Mbps data rate.

Channel 1 / 2412 MHz



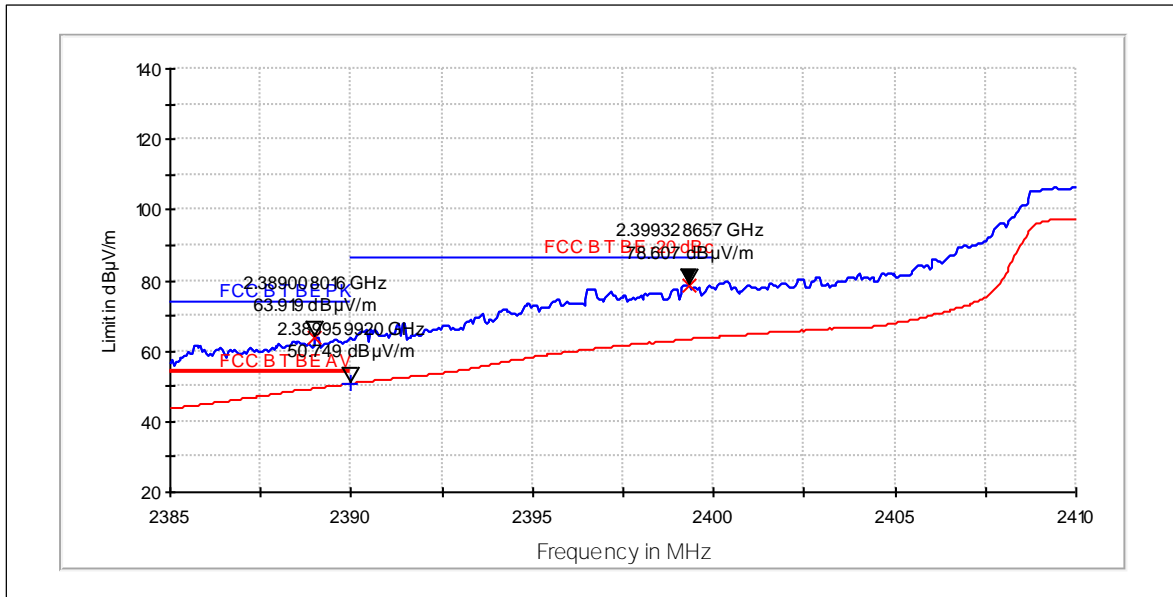
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2389	60.49	1058.522	70.04	-9.55	PASSED
2400	74.52	5321.695	84.07	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	45.2	181.97	54.75	-9.55	PASSED

Channel 2 / 2417 MHz



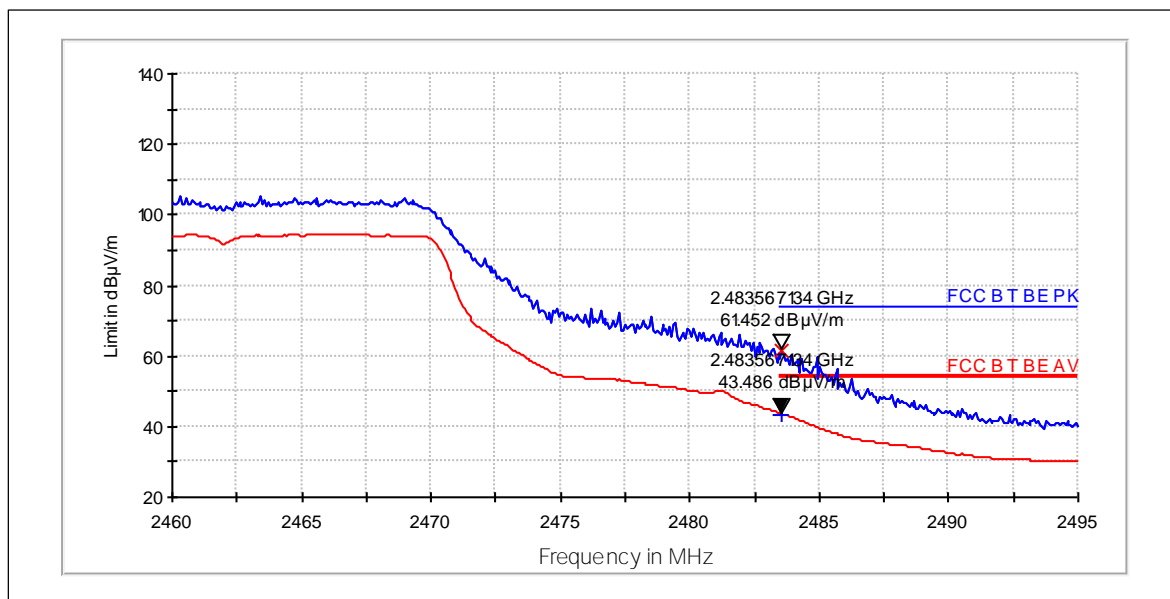
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2389	63.92	1570.182	73.47	-9.55	PASSED
2399	78.61	8518.243	88.16	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	50.75	344.707	60.3	-9.55	PASSED

Channel 11 / 2462 MHz



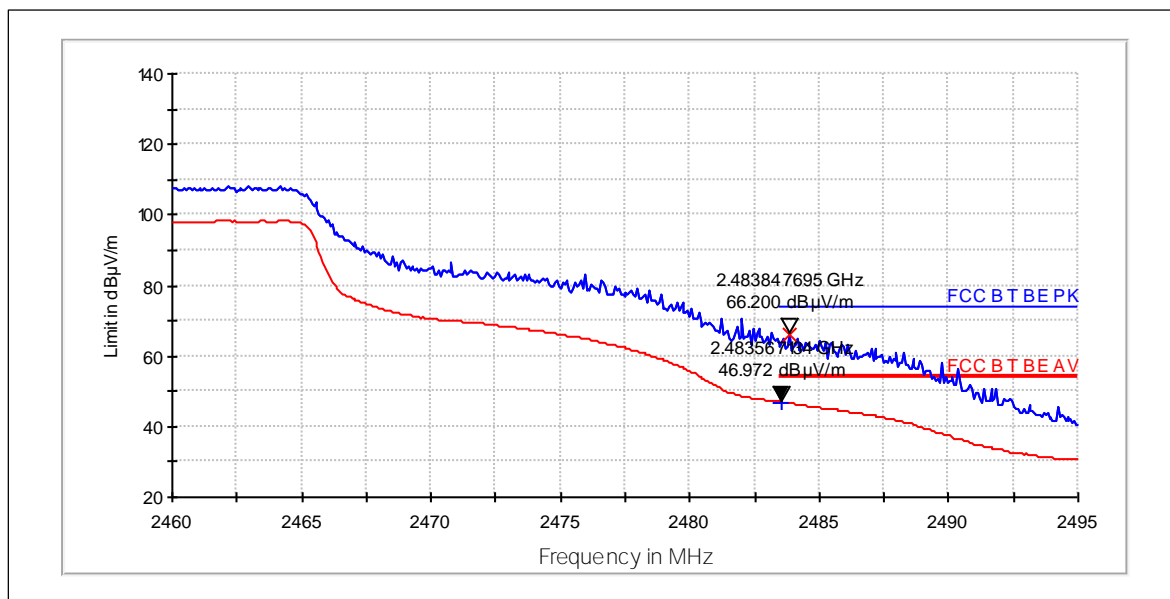
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	61.45	1181.952	71.02	-9.57	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	43.49	149.383	53.06	-9.57	PASSED

Channel 10 / 2457 MHz



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

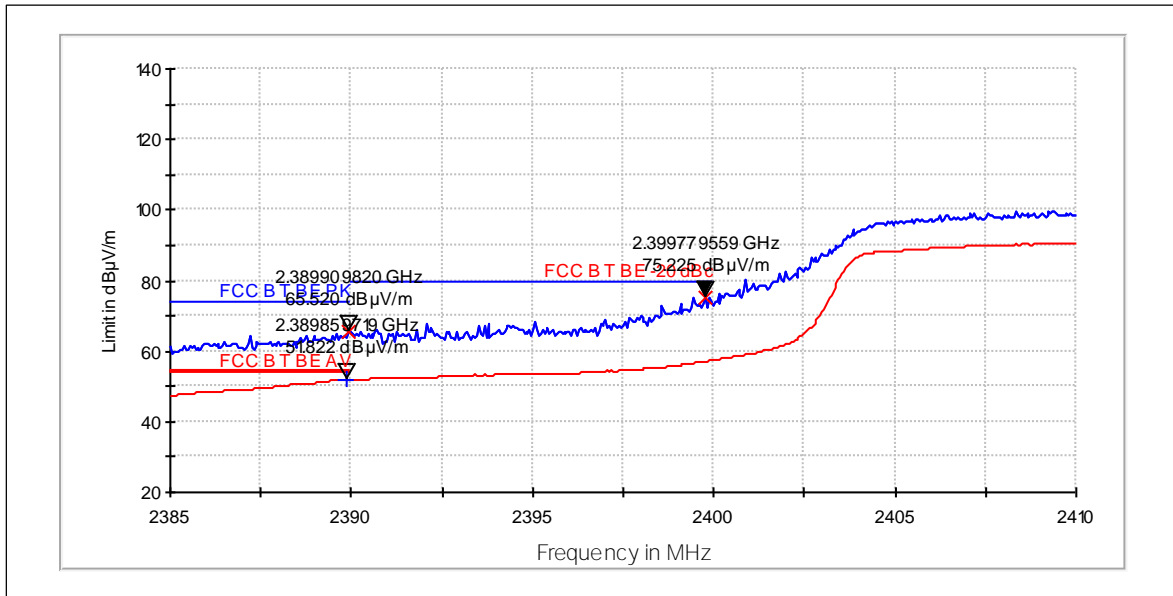
Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	66.2	2041.738	75.77	-9.57	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	46.97	223.152	56.54	-9.57	PASSED

### 4.3.3 802.11n, BPSK modulation, 13.5 / 15.0 Mbps data rate.

Channel 1-5 / 2422MHz



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

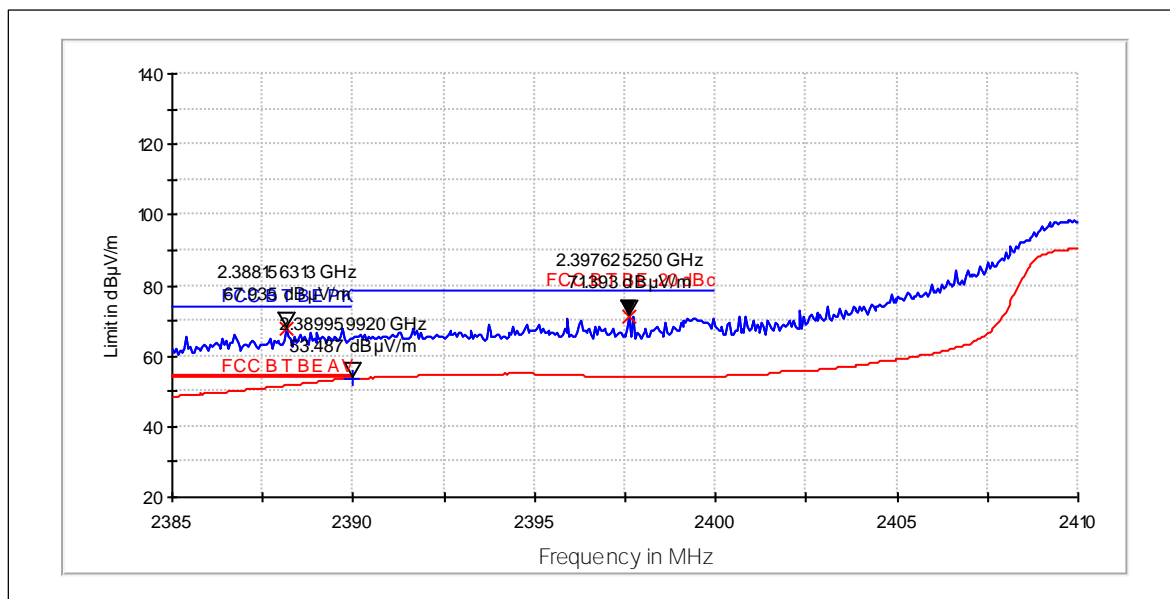
Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	65.52	1887.991	75.07	-9.55	PASSED
2400	75.23	5770.986	84.78	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	51.82	390.032	61.37	-9.55	PASSED



Channel 2-6 / 2427MHz



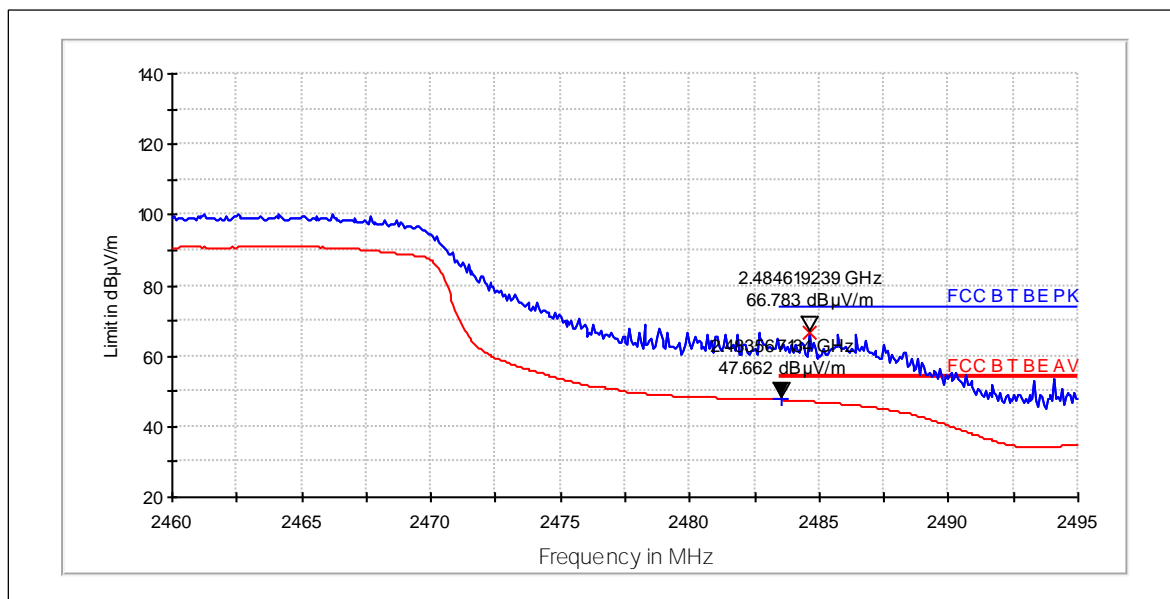
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2388	67.94	2493.159	77.49	-9.55	PASSED
2398	71.39	3712.359	80.94	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	53.49	472.444	63.04	-9.55	PASSED

Channel 7-11 / 2452MHz



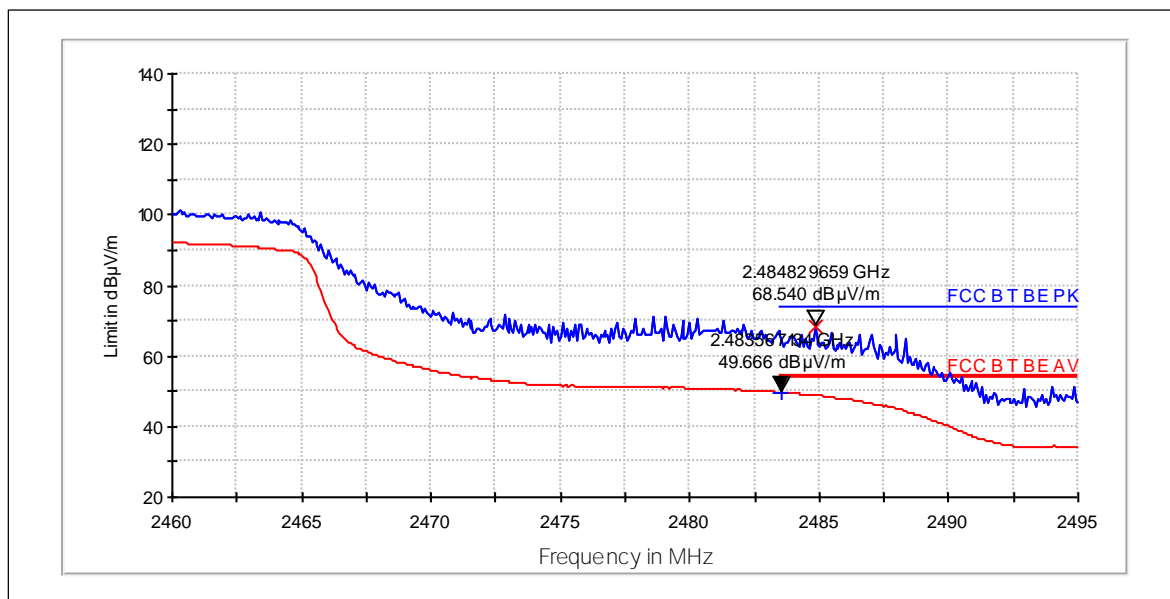
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2485	66.78	2183.484	76.35	-9.57	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	47.66	241.602	57.23	-9.57	PASSED

Channel 6-10 / 2447MHz



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

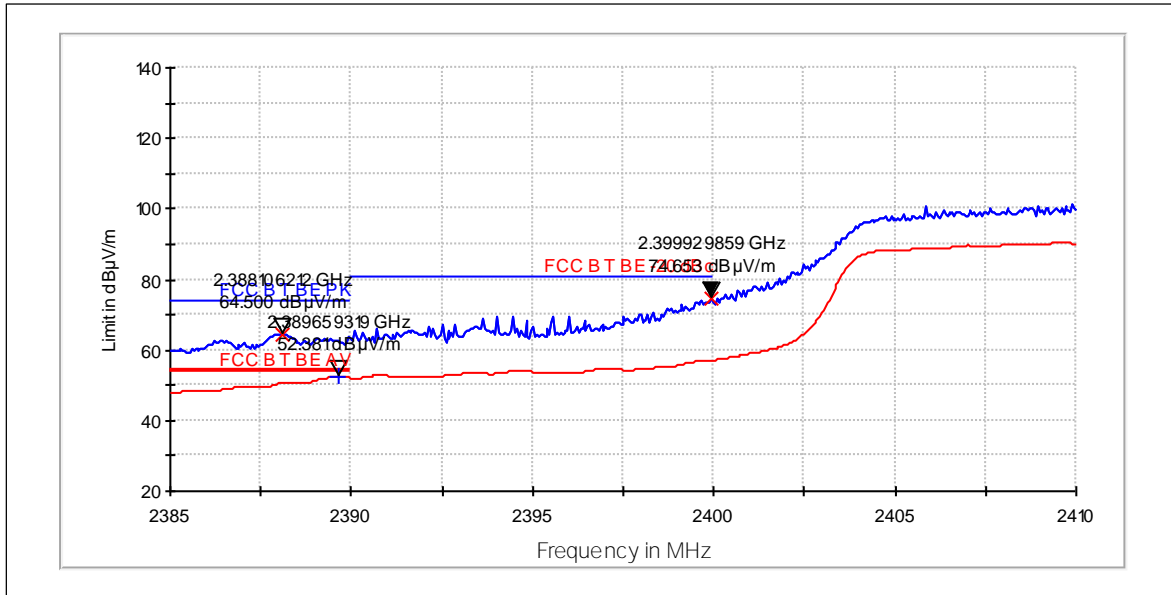
Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2485	68.54	2673.006	78.11	-9.57	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	49.67	304.299	59.24	-9.57	PASSED

**4.3.4 802.11n, 16QAM modulation, 54.0 / 60.0 Mbps data rate.**

Channel 1-5 / 2422MHz



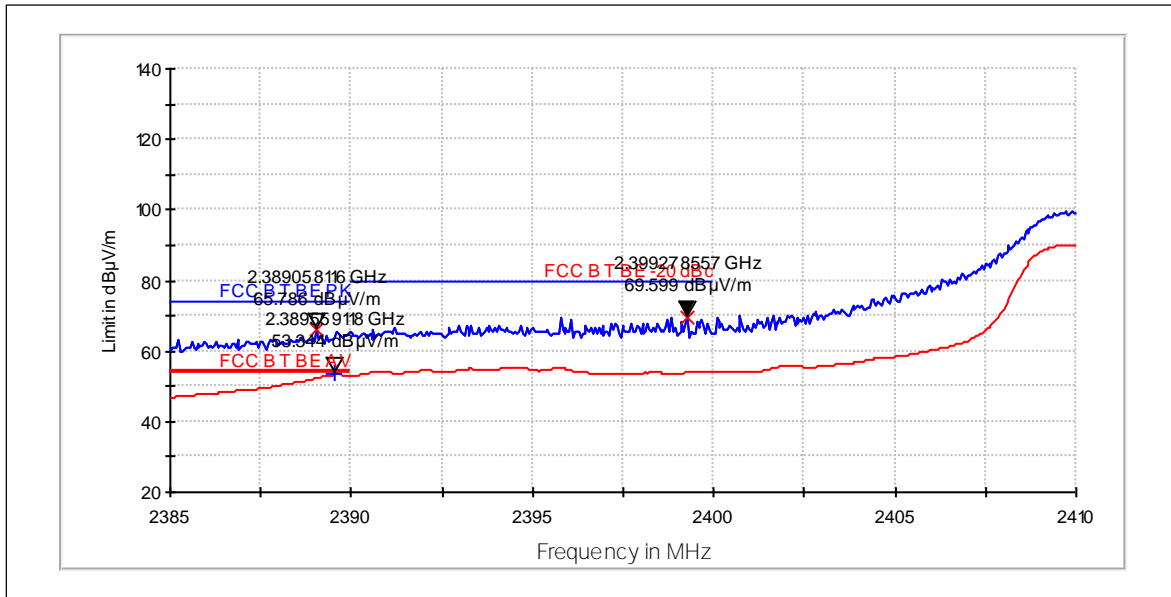
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2388	64.5	1678.804	74.05	-9.55	PASSED
2400	74.65	5403.187	84.2	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	52.38	415.958	61.93	-9.55	PASSED

Channel 2-6 / 2427MHz



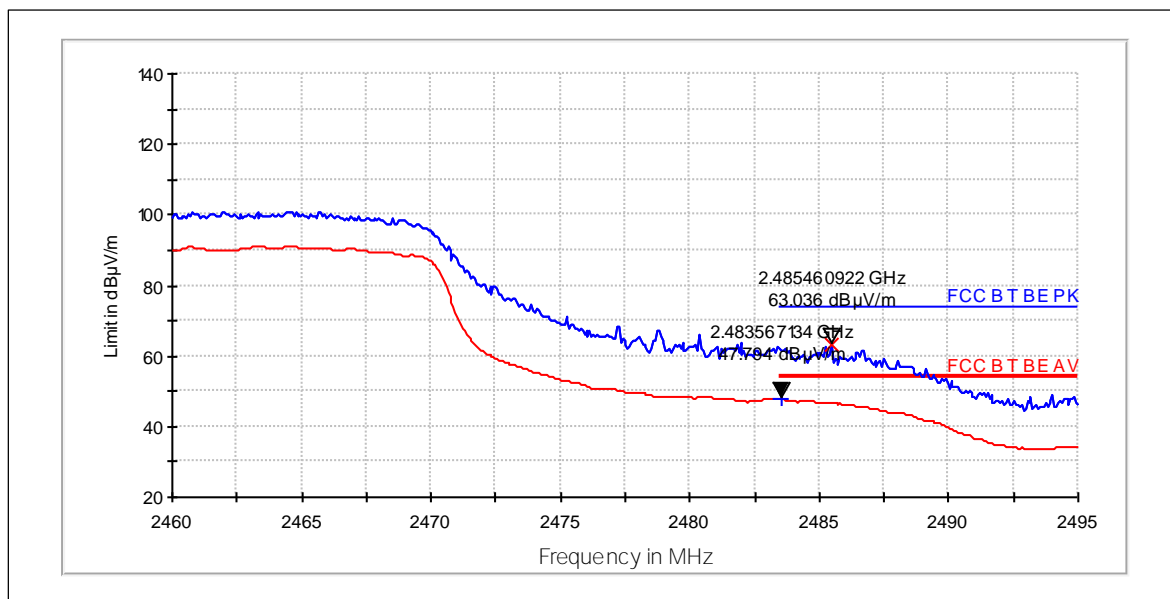
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2389	65.79	1946.704	75.34	-9.55	PASSED
2399	69.6	3019.604	79.15	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	53.34	464.729	62.89	-9.55	PASSED

Channel 7-11 / 2452MHz



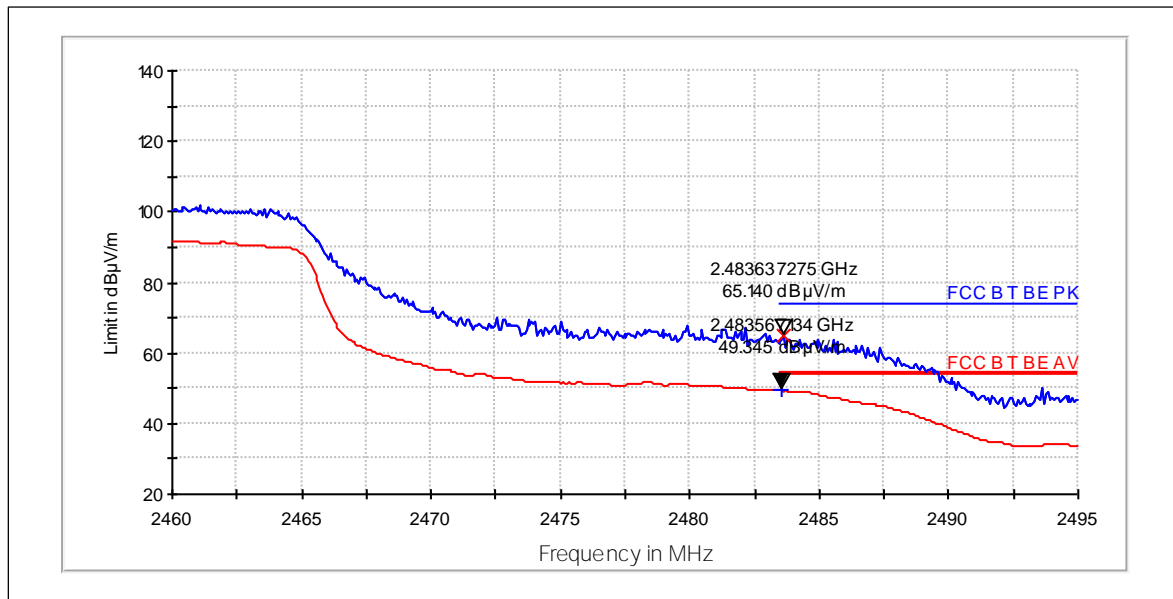
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2485	63.04	1418.404	72.59	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	47.79	245.301	57.34	-9.55	PASSED

Channel 6-10 / 2447MHz



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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	65.14	1807.174	74.69	-9.55	PASSED

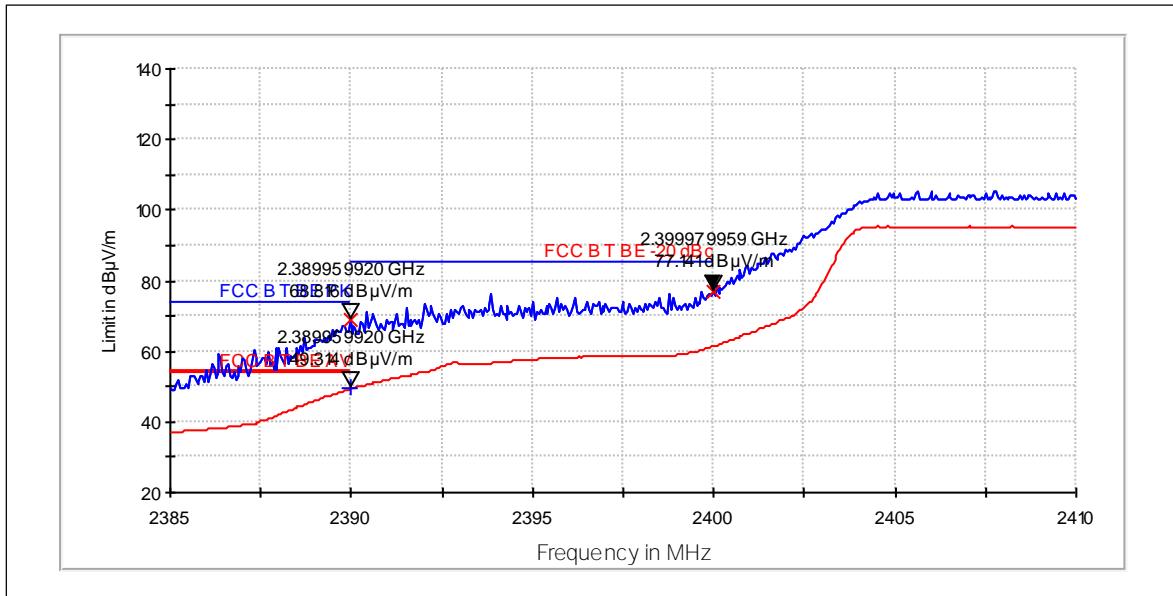
Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	49.35	293.258	58.9	-9.55	PASSED

#### 4.4. WLAN test results, Orthogonal position 3

##### 4.4.1 802.11g, BPSK modulation, 6 Mbps data rate.

Channel 1 / 2412 MHz



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

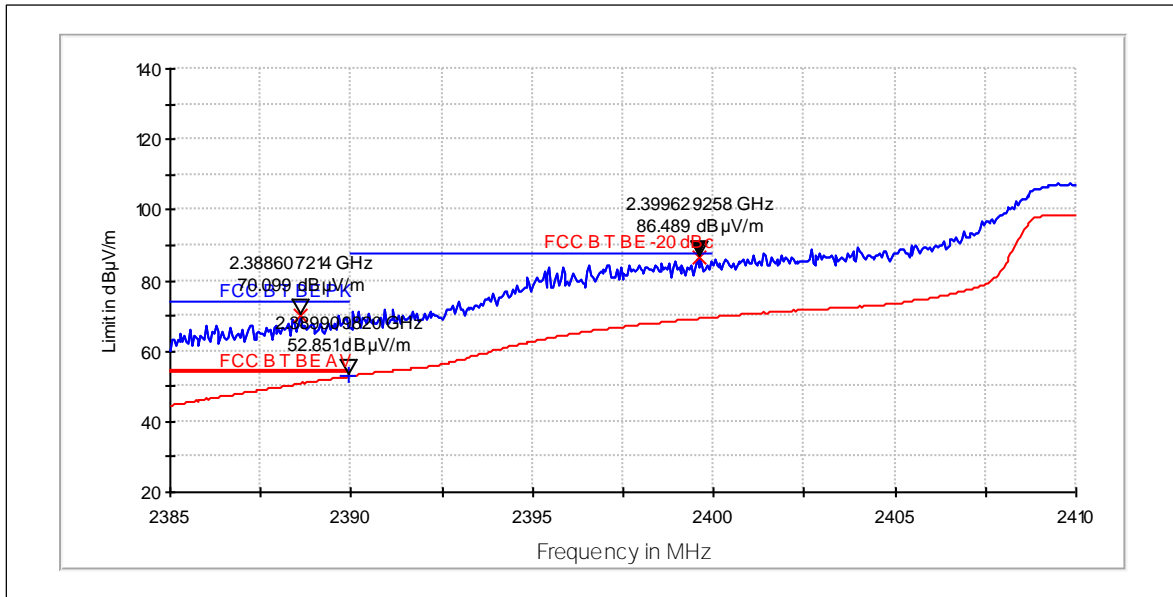
Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Results
2390	68.82	2759.307	78.37	-9.55	PASSED
2400	77.14	7195.318	86.69	-9.55	PASSED

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

Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Results
2390	49.31	292.213	58.86	-9.55	PASSED



Channel 2 / 2417 MHz



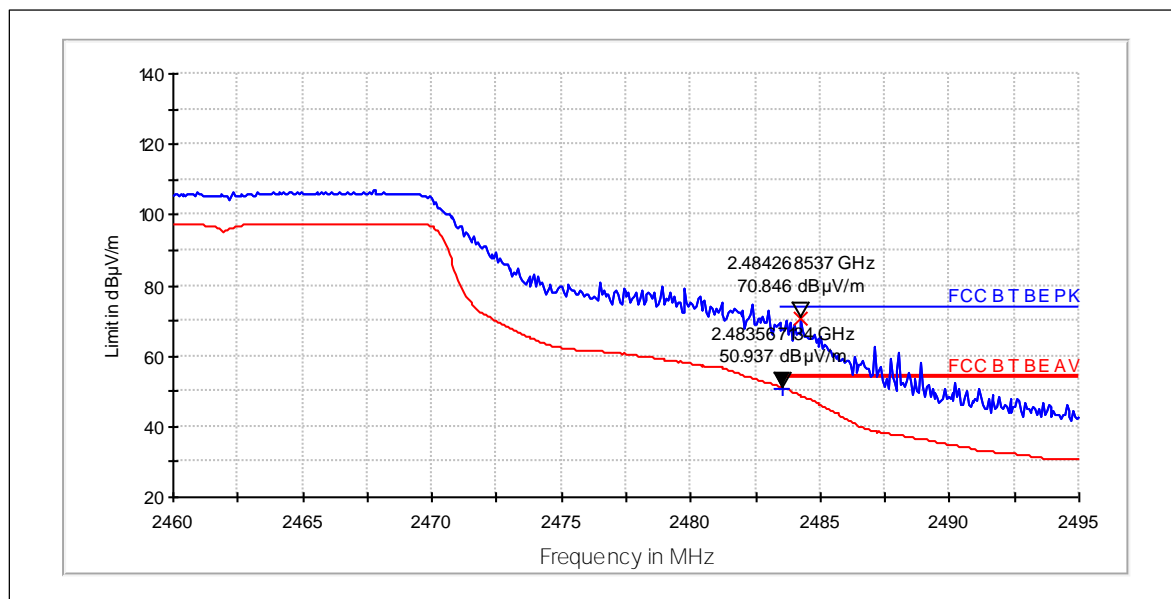
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2389	70.1	3198.527	79.65	-9.55	PASSED
2400	86.49	21108.142	96.04	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	52.85	439.086	62.4	-9.55	PASSED

Channel 11 / 2462 MHz



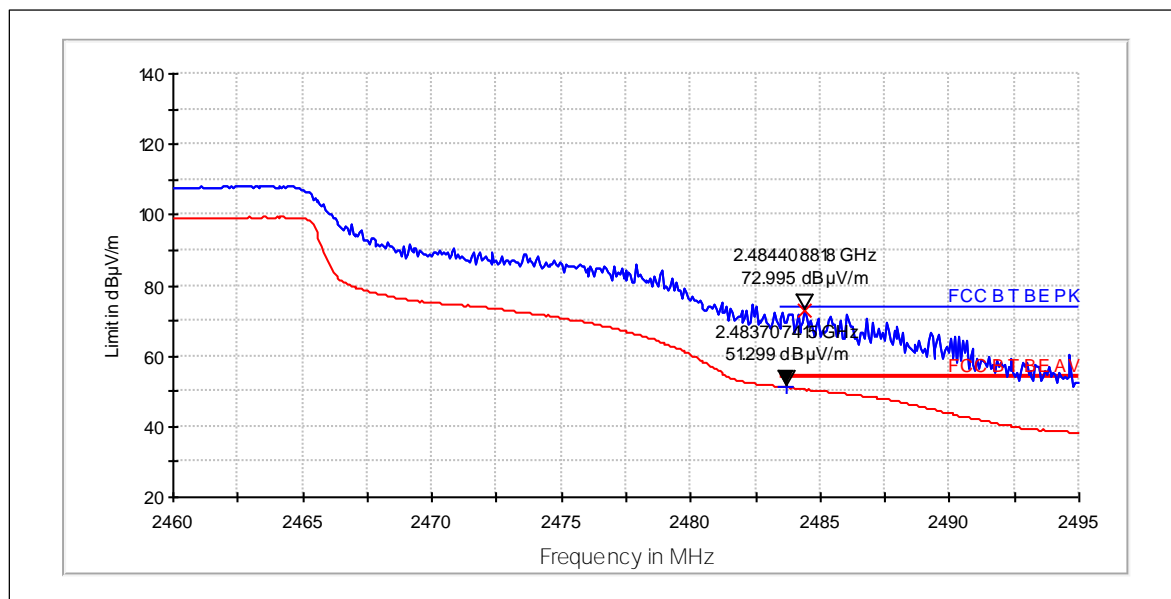
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	70.85	3485.78	80.42	-9.57	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	50.94	352.249	60.51	-9.57	PASSED

Channel 10 / 2457 MHz



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

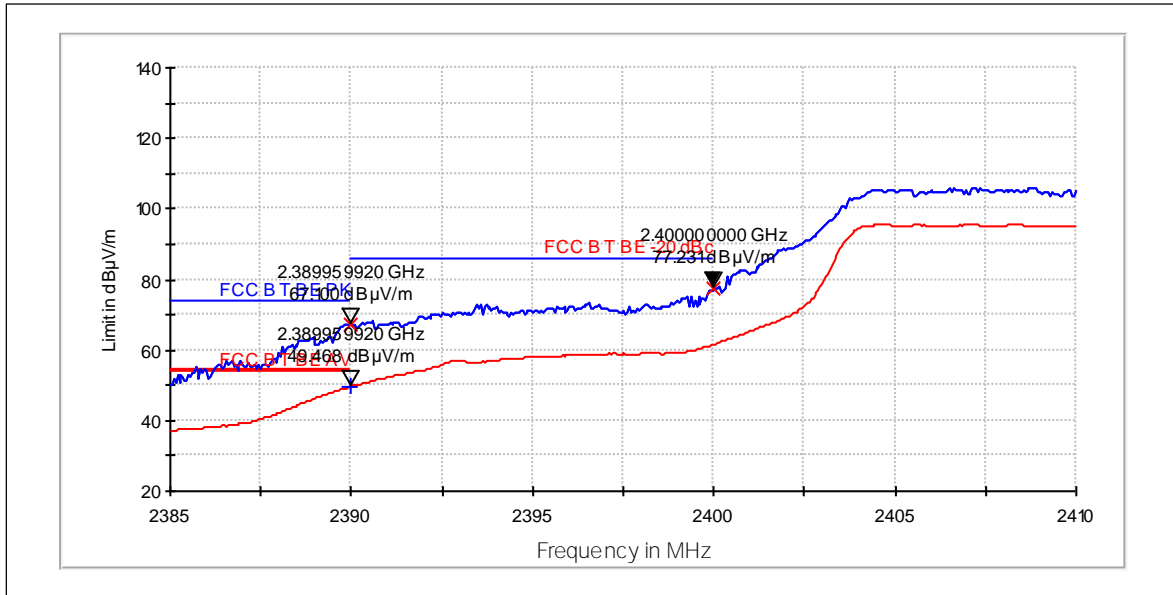
Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	73	4464.265	82.57	-9.57	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	51.3	367.24	60.87	-9.57	PASSED

#### 4.4.2 802.11g, 16QAM modulation, 24 Mbps data rate.

Channel 1 / 2412 MHz



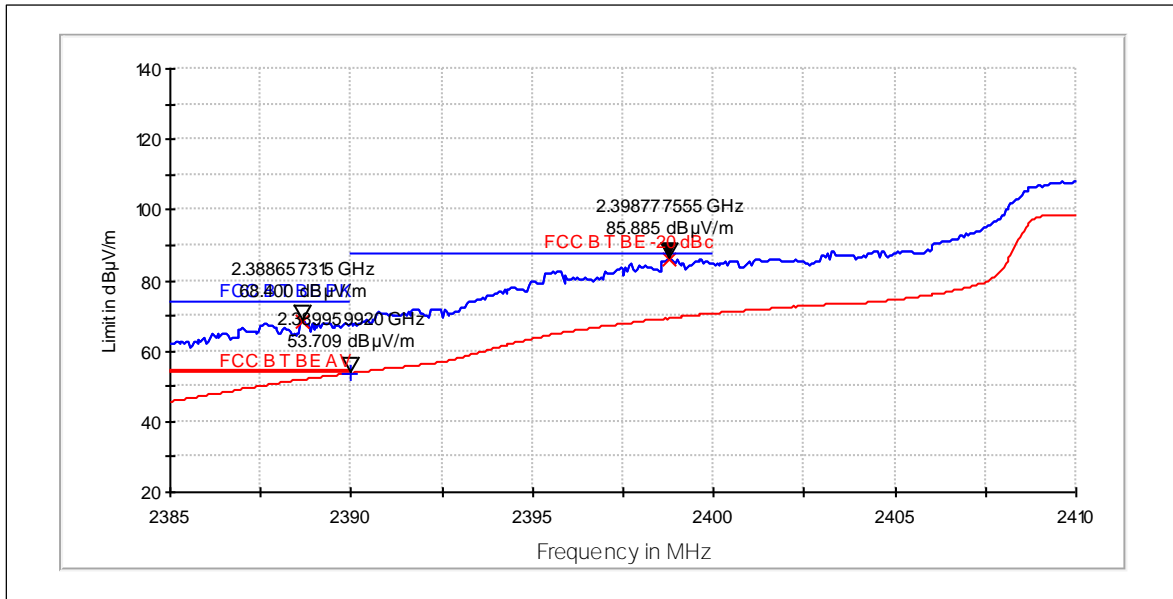
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	67.1	2264.644	76.65	-9.55	PASSED
2400	77.23	7270.261	86.78	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	49.47	297.44	59.02	-9.55	PASSED

Channel 2 / 2417 MHz



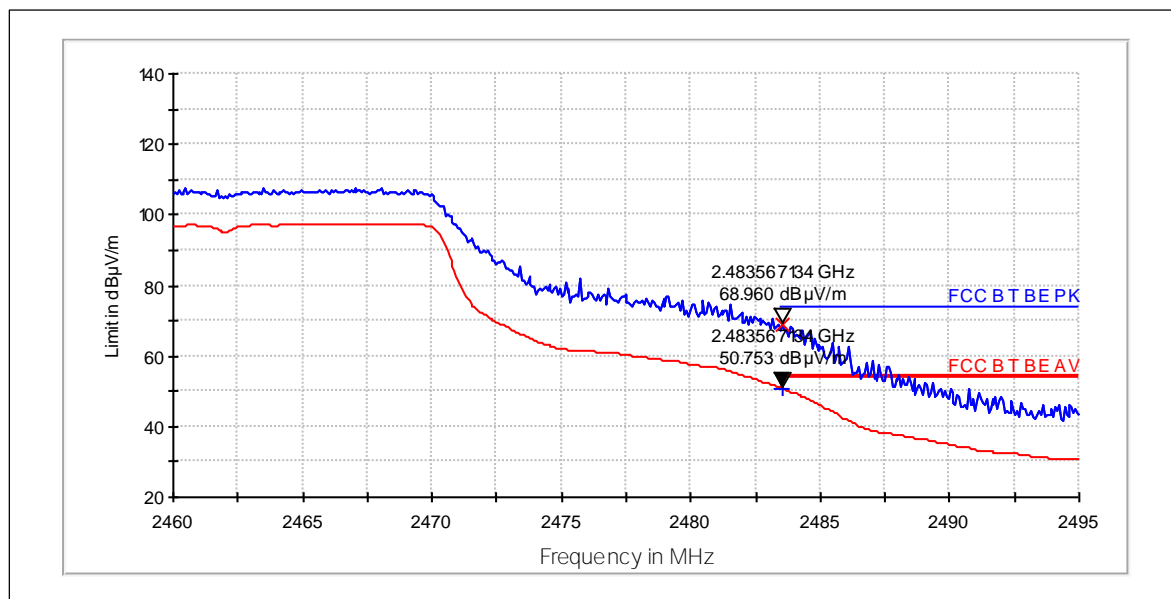
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2389	68.4	2630.268	77.95	-9.55	PASSED
2399	85.89	19690.194	95.44	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	53.71	484.674	63.26	-9.55	PASSED

Channel 11 / 2462 MHz



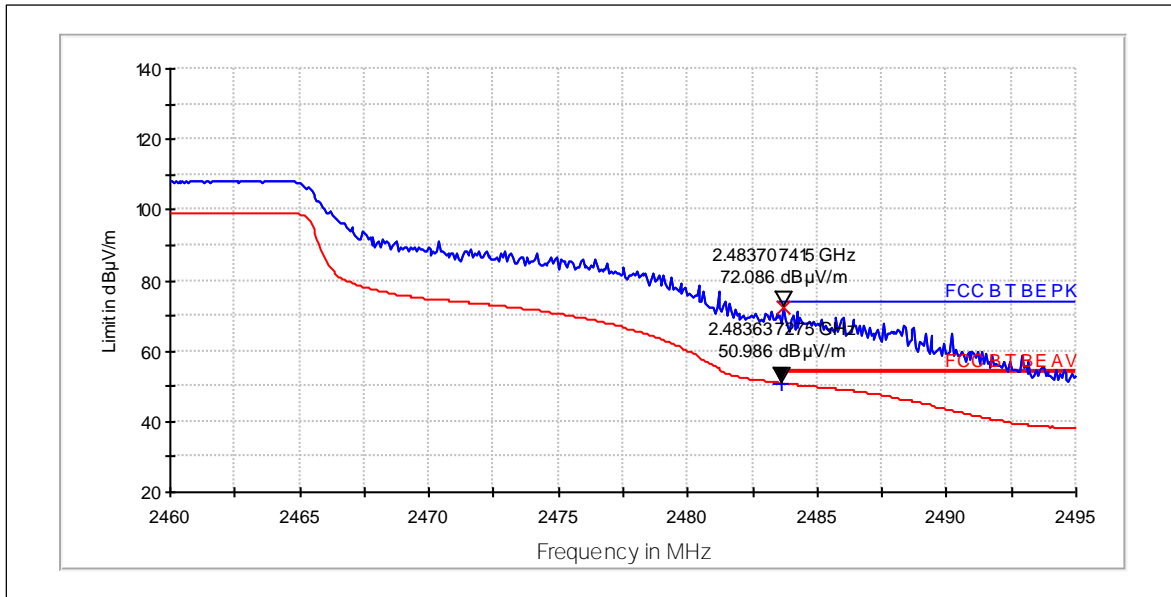
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	68.96	2805.434	78.53	-9.57	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	50.75	344.866	60.32	-9.57	PASSED

Channel 10 / 2457 MHz



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

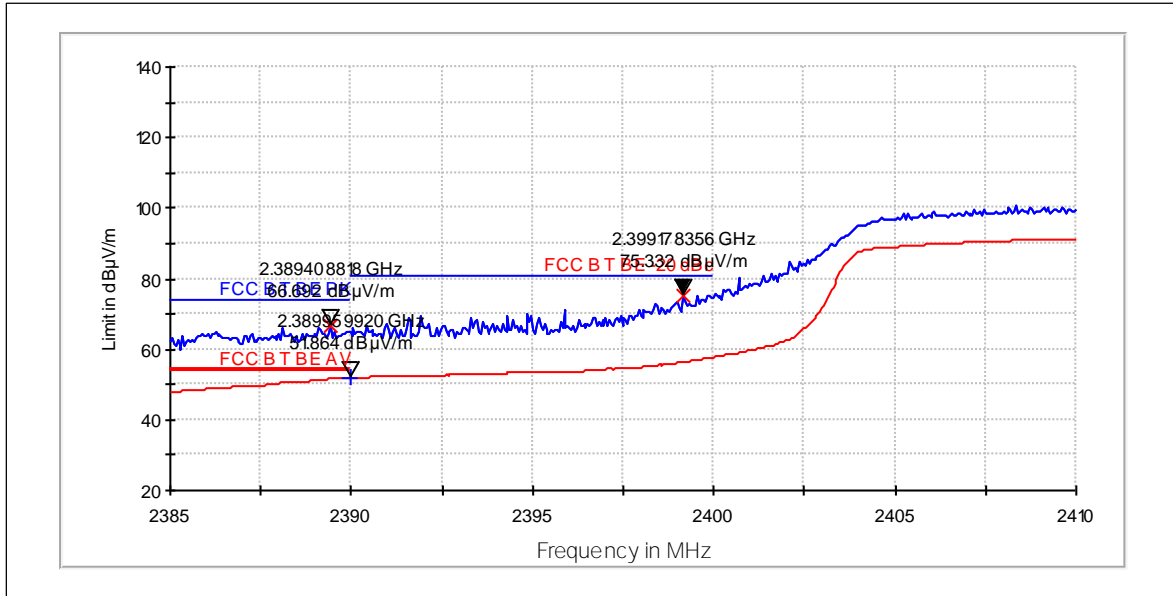
Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	72.09	4020.685	81.66	-9.57	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	50.99	354.242	60.56	-9.57	PASSED

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

Channel 1-5 / 2422MHz



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

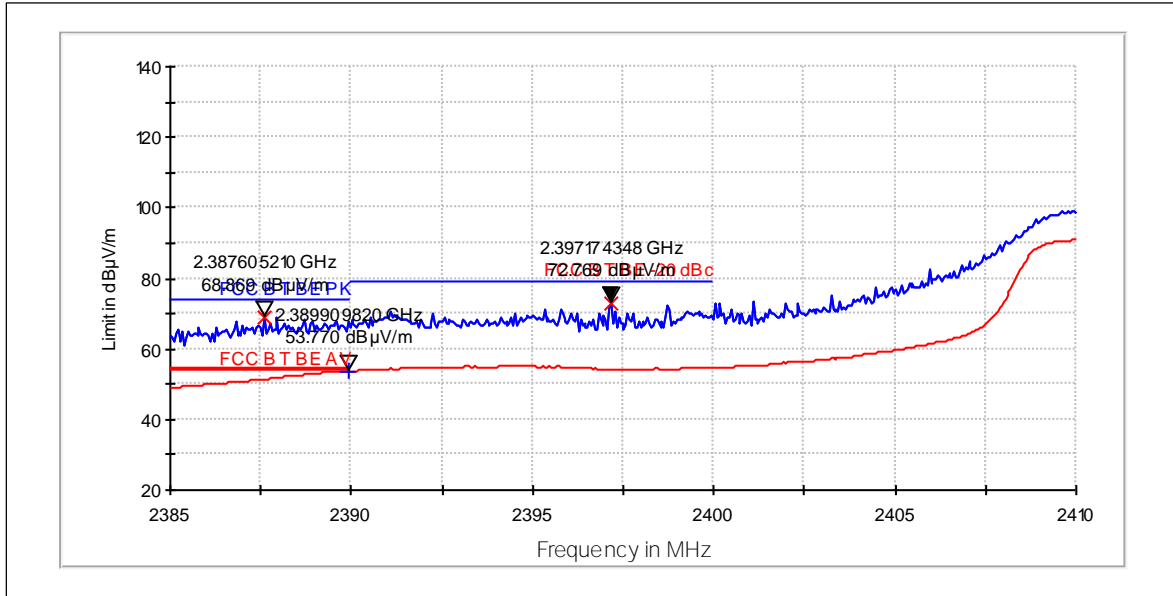
Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2389	66.69	2160.728	76.24	-9.55	PASSED
2399	75.33	5842.517	84.88	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	51.86	391.922	61.41	-9.55	PASSED



Channel 2-6 / 2427MHz



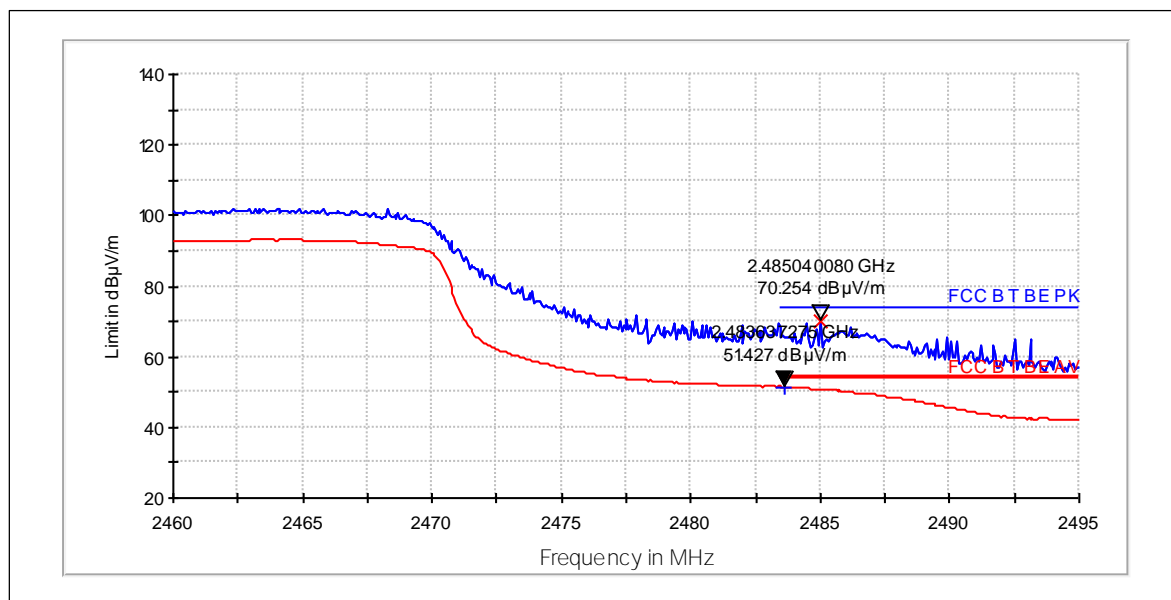
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2388	68.87	2776.195	78.42	-9.55	PASSED
2397	72.77	4349.607	82.32	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	53.77	488.09	63.32	-9.55	PASSED

Channel 7-11 / 2452MHz



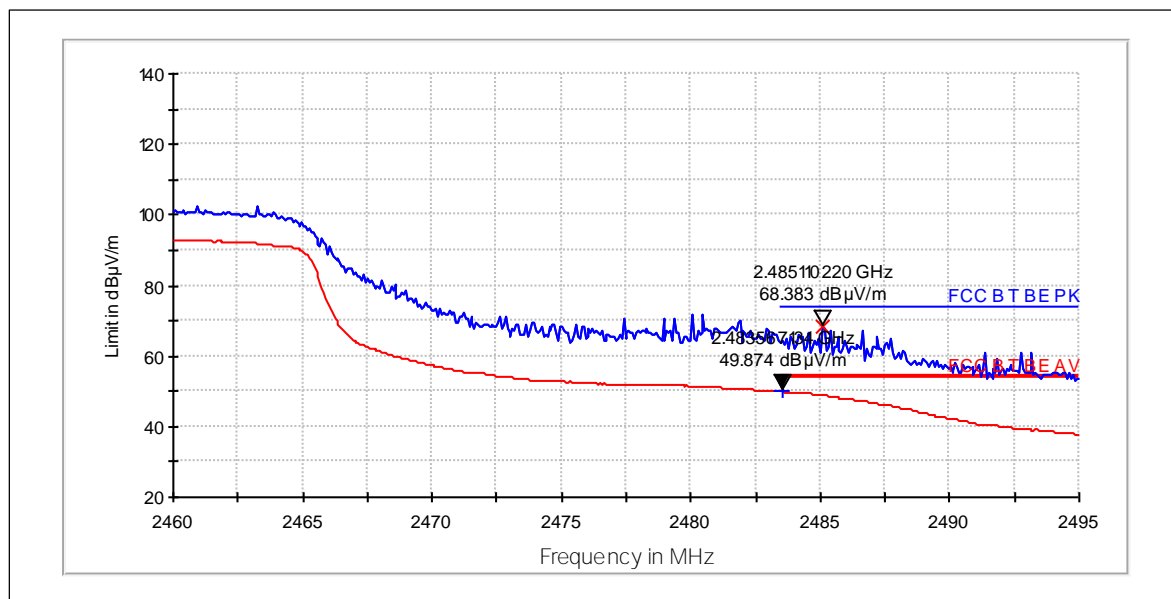
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2485	70.25	3256.117	79.82	-9.57	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	51.43	372.692	61	-9.57	PASSED

Channel 6-10 / 2447MHz



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

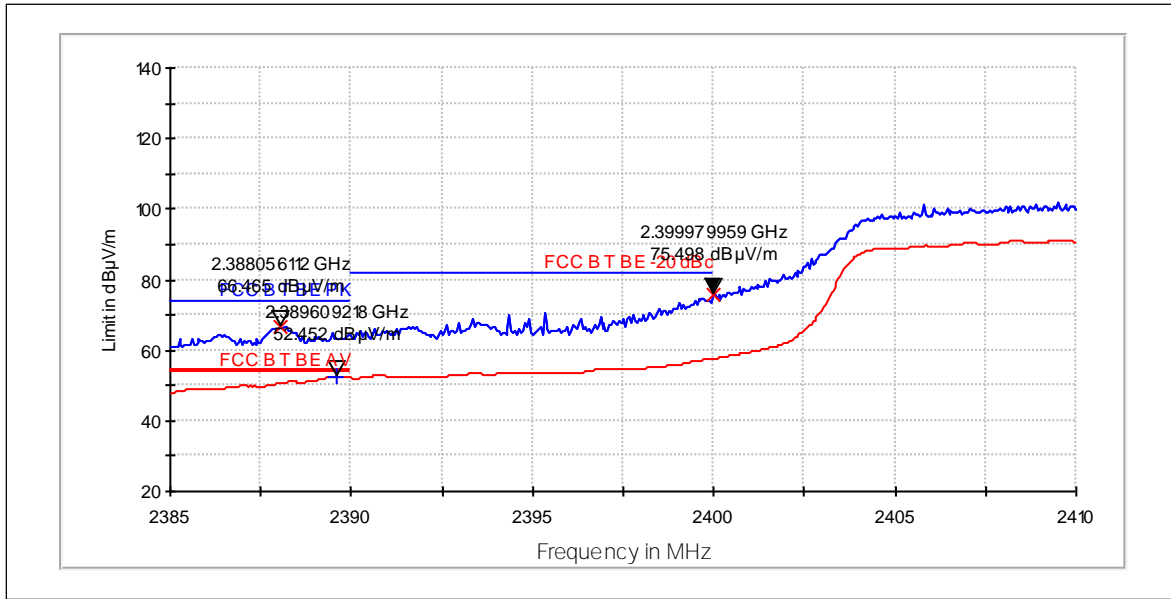
Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2485	68.38	2625.125	77.95	-9.57	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	49.87	311.674	59.44	-9.57	PASSED

**4.4.4 802.11n, 16QAM modulation, 54.0 / 60.0 Mbps data rate.**

Channel 1-5 / 2422MHz



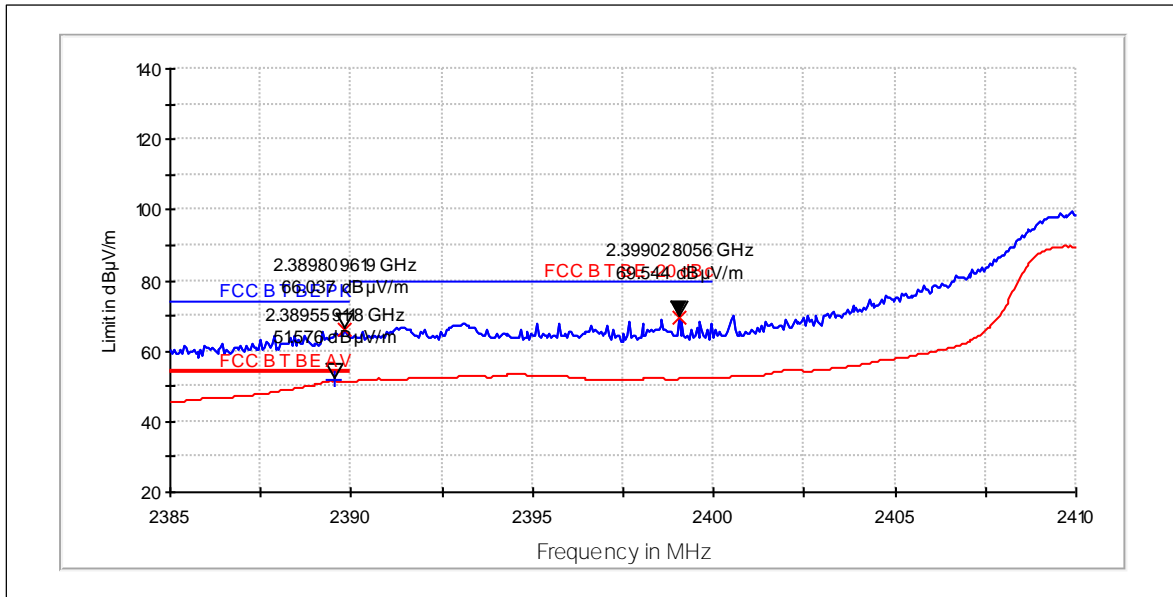
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2388	66.47	2104.99	76.02	-9.55	PASSED
2400	75.5	5955.25	85.05	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	52.45	419.373	62	-9.55	PASSED

Channel 2-6 / 2427MHz



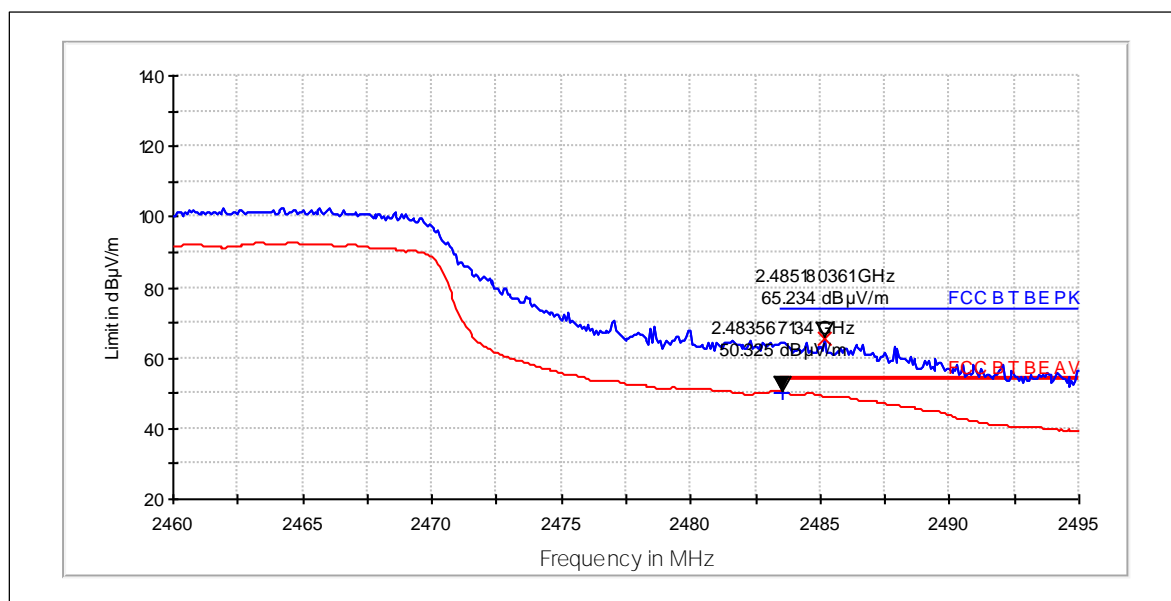
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	66.04	2003.78	75.59	-9.55	PASSED
2399	69.54	3000.544	79.09	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2390	51.58	379.14	61.13	-9.55	PASSED

Channel 7-11 / 2452MHz



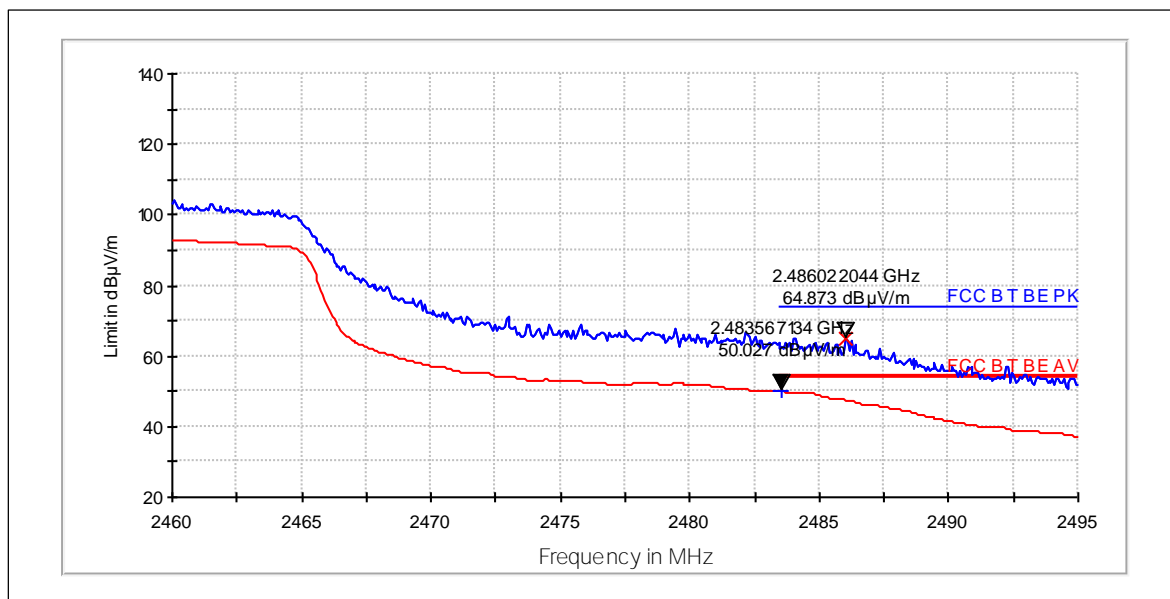
Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2485	65.23	1826.838	74.78	-9.55	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	50.33	328.284	59.88	-9.55	PASSED

Channel 6-10 / 2447MHz



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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2486	64.87	1752.468	74.42	-9.55	PASSED

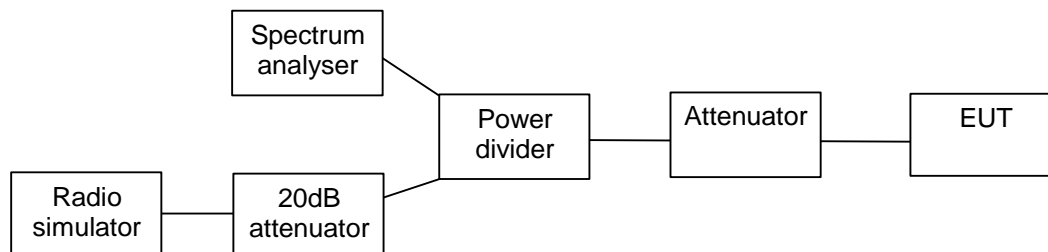
Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U <sub>RX</sub> [dBµV]	A <sub>TOT</sub> [dB]	Results
2484	50.03	317.212	59.58	-9.55	PASSED

## 5. Spurious RF conducted emissions

<b>EUT with DUT number</b>	RM-1152, DUT 400052
<b>Accessories with DUT numbers</b>	SD-134, DUT 400053
<b>Operation Voltage [V] / [Hz]</b>	Nominal
<b>Results</b>	PASSED
<b>Remarks</b>	RF Cond 2
<b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b>	22 / 45 / 100
<b>Date of measurements</b>	27-Oct-2015
<b>Measured by</b>	Hannu Soderholm

### 5.1. Test Setup



### 5.2. Test method and limit

The measurement is made according ANSI C63.10 and RSS-247.

The reference level for the -20 dBc measurement was obtained as instructed in section 11.11.2 of ANSI C63.10, using span of 1.5 times the OBW.

Limits for spurious RF conducted emissions measurements

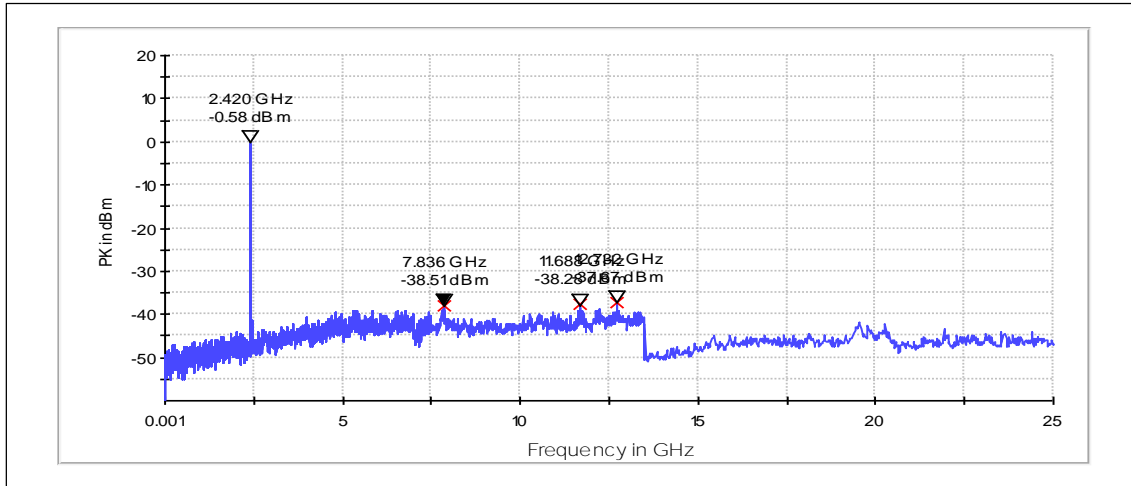
Frequency range [MHz]	Limit [dBc]
1 – 25000	-20



### 5.3. WLAN Test results

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

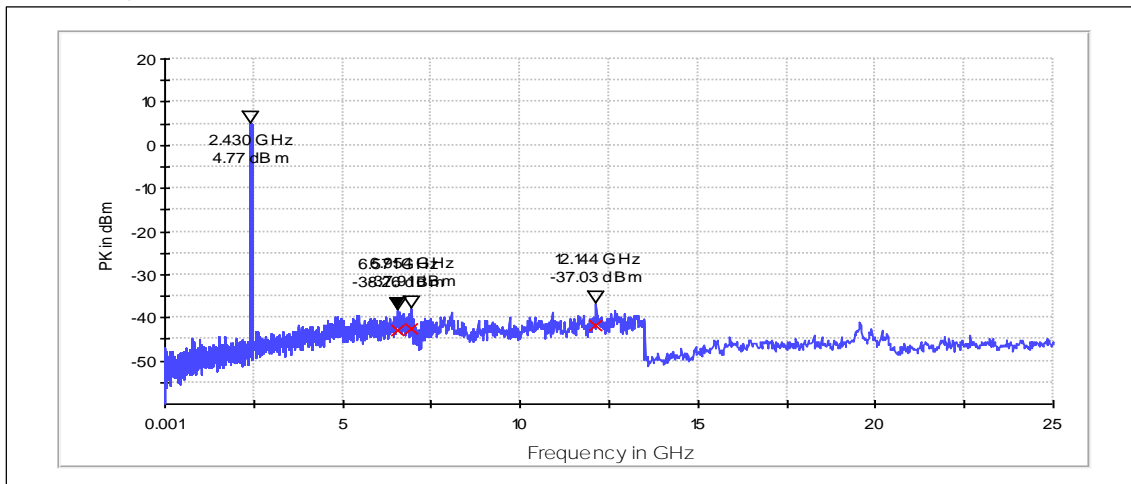
Channel 1 / 2412 MHz



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

Frequency [MHz]	P [dBc]	Result
12732.000	-37.09	PASSED
11688.000	-37.70	PASSED
7836.000	-37.93	PASSED

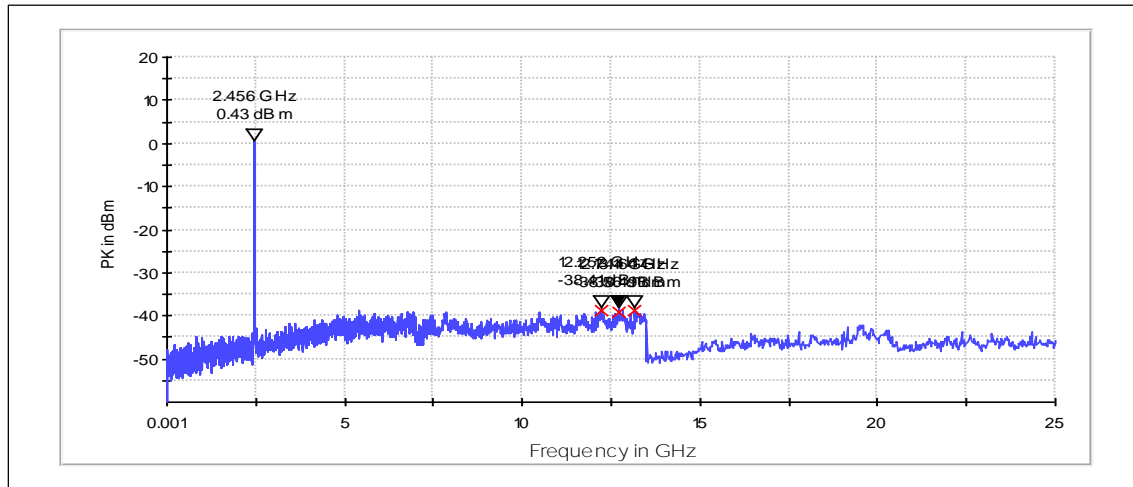
Channel 6 / 2437 MHz



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

Frequency [MHz]	P [dBc]	Result
12144.000	-41.80	PASSED
6953.600	-42.67	PASSED
6570.800	-43.03	PASSED

Channel 11 / 2462 MHz

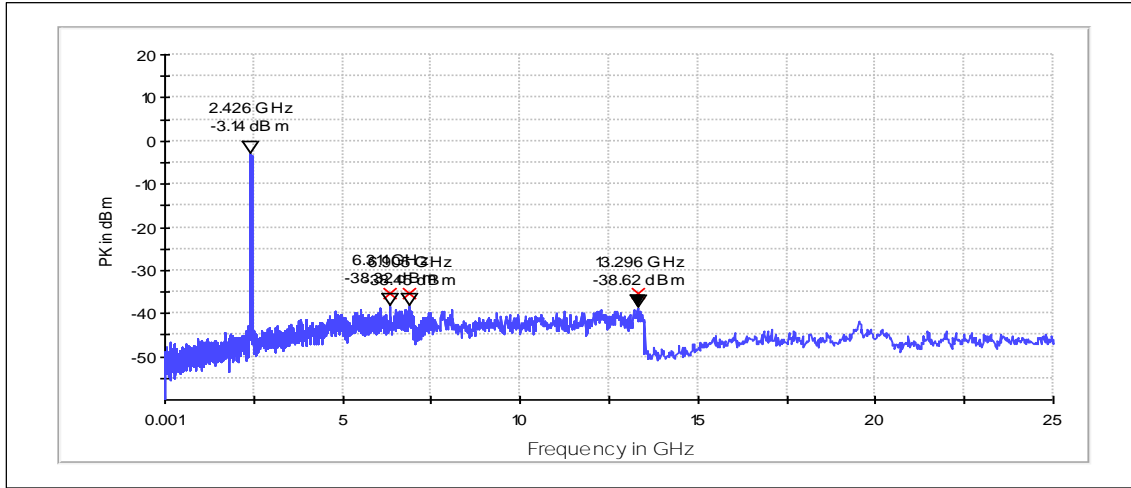


Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
12252.000	-38.84	PASSED
13164.000	-38.93	PASSED
12744.000	-38.99	PASSED

**5.3.2 802.11n Main mode, BPSK modulation, 13.5 / 15 Mbps data rate**

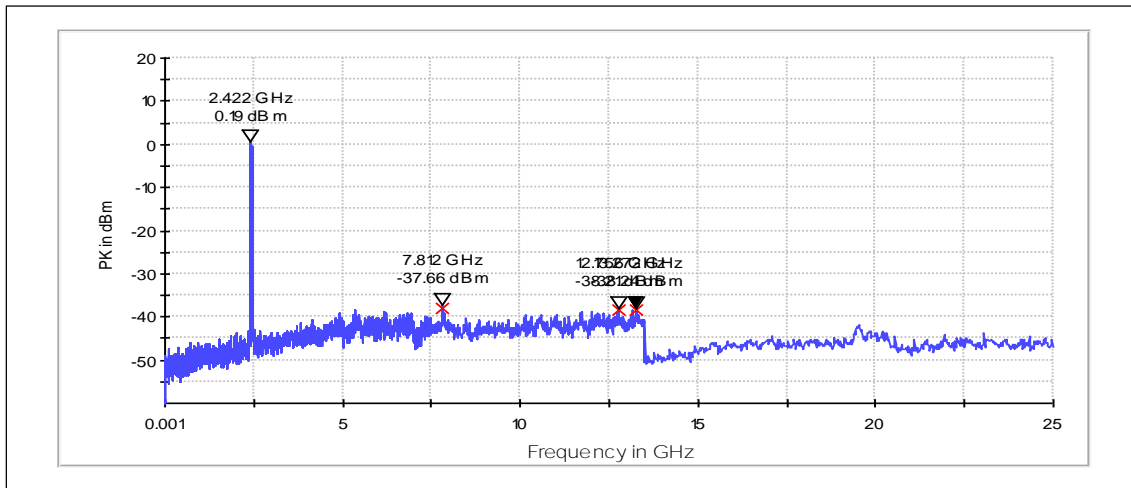
Channel 1-5 / 2422 MHz



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

Frequency [MHz]	P [dBc]	Result
6311.200	-35.18	PASSED
6905.200	-35.31	PASSED
13296.000	-35.48	PASSED

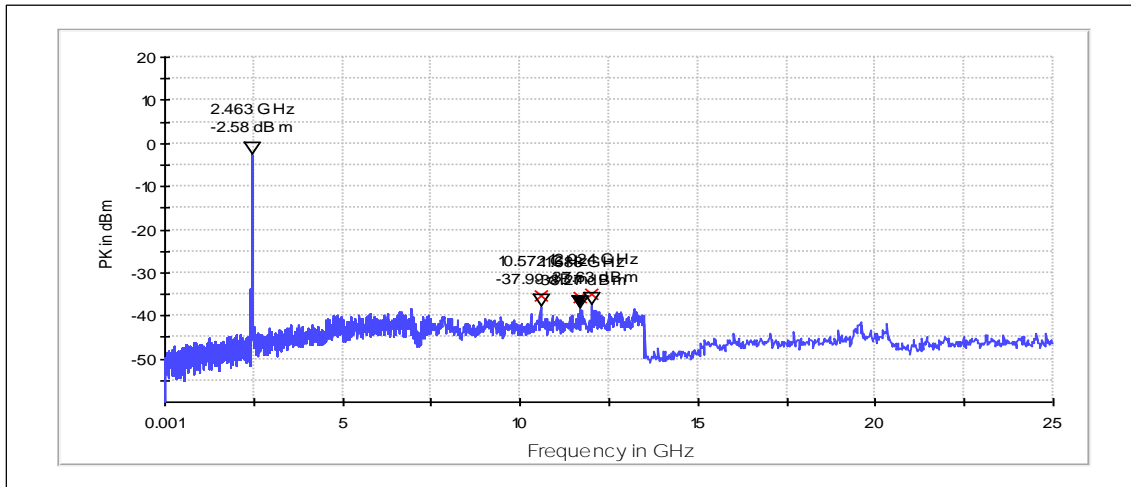
Channel 4-8 / 2437 MHz



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

Frequency [MHz]	P [dBc]	Result
7812.000	-37.85	PASSED
12756.000	-38.39	PASSED
13272.000	-38.42	PASSED

Channel 7-11 / 2452 MHz

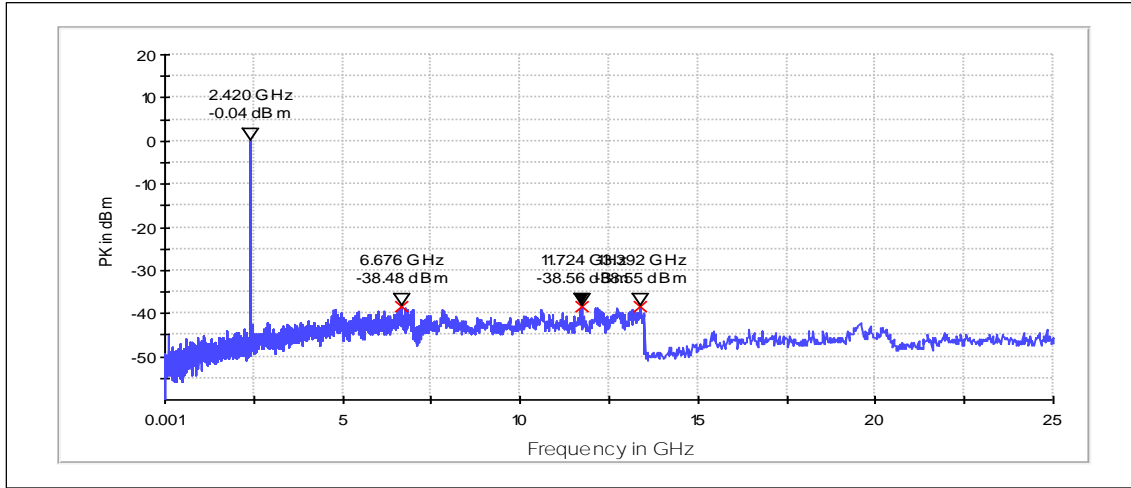


Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
12024.000	-35.05	PASSED
10572.000	-35.41	PASSED
11688.000	-35.69	PASSED

### 5.3.3 802.11g Main mode, 16QAM modulation, 24 Mbps data rate

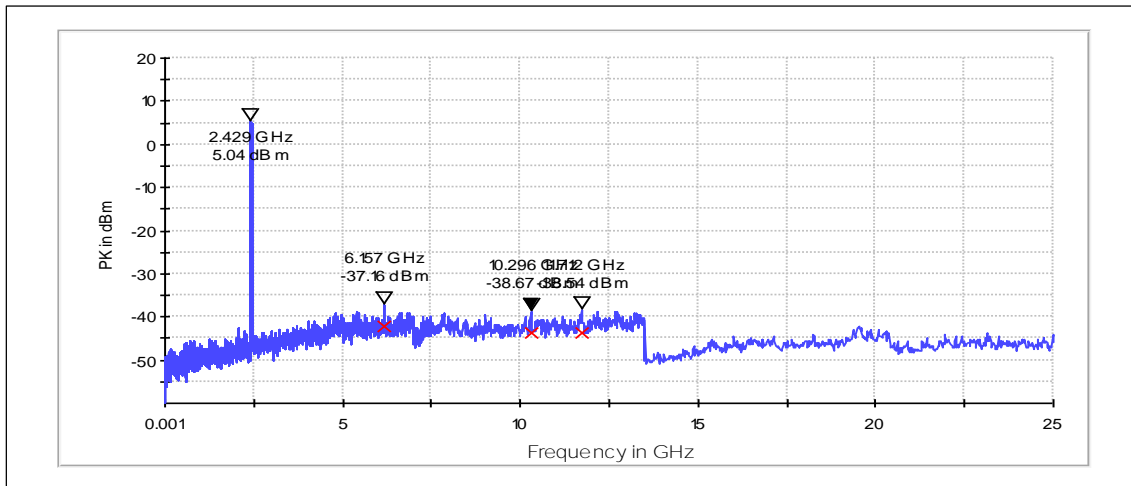
Channel 1 / 2412 MHz



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

Frequency [MHz]	P [dBc]	Result
6676.400	-38.44	PASSED
13392.000	-38.51	PASSED
11724.000	-38.53	PASSED

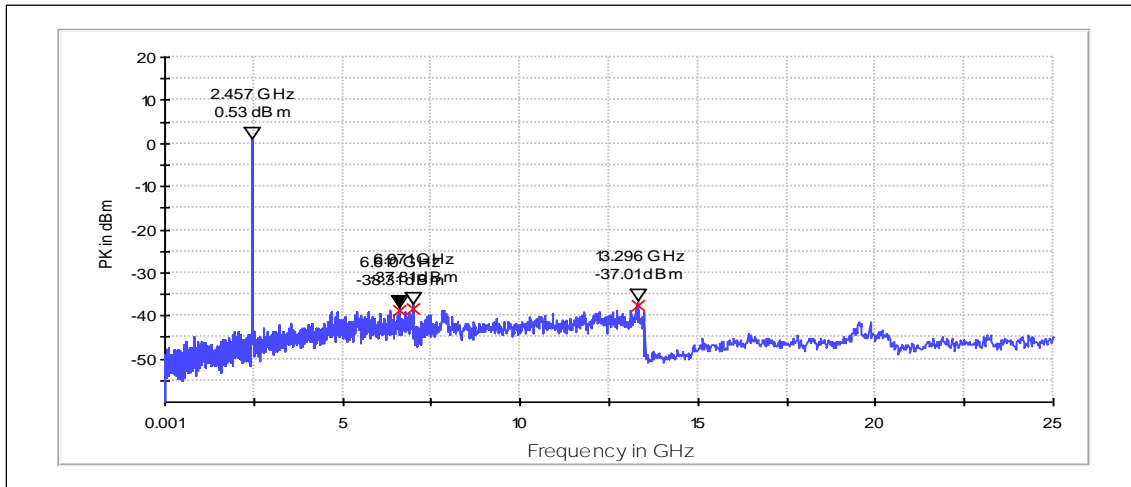
Channel 6 / 2437 MHz



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

Frequency [MHz]	P [dBc]	Result
6157.200	-42.20	PASSED
11712.000	-43.58	PASSED
10296.000	-43.71	PASSED

Channel 11 / 2462 MHz

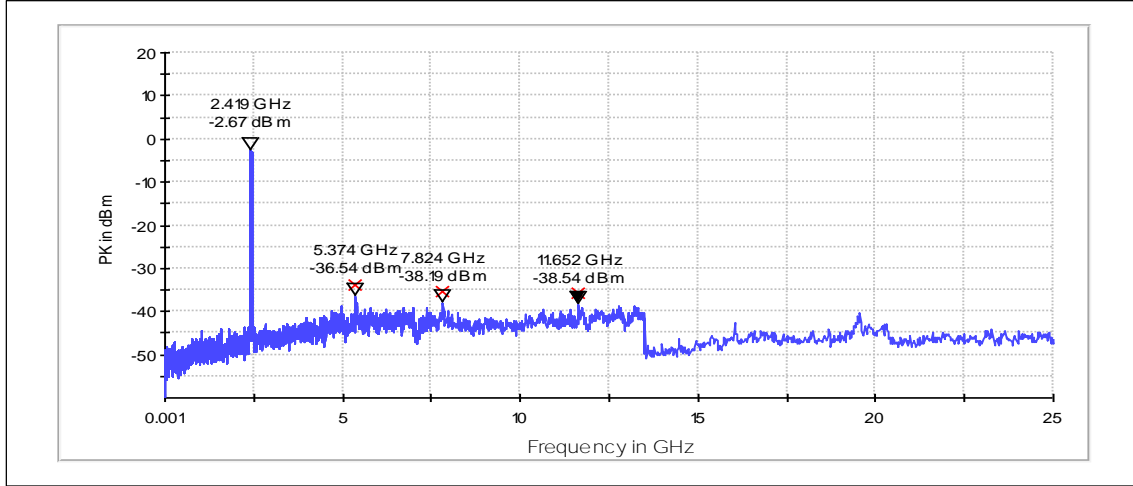


Peak (RBW: 100 kHz, VBW: 300 kHz)

Frequency [MHz]	P [dBc]	Result
13296.000	-37.55	PASSED
6971.200	-38.35	PASSED
6610.400	-38.85	PASSED

**5.3.4 802.11n Main mode, 16QAM modulation, 54 / 60 Mbps data rate**

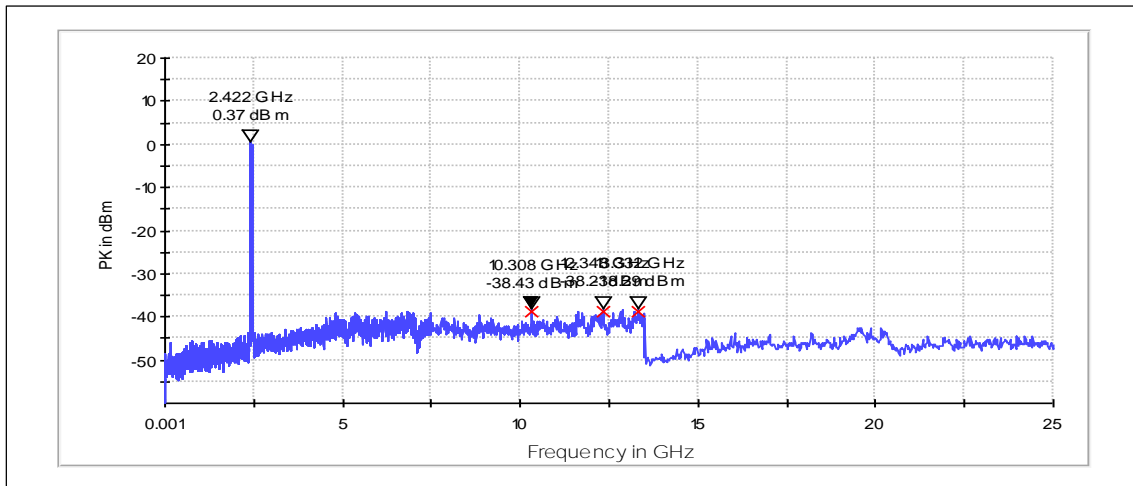
Channel 1-5 / 2422 MHz



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

Frequency [MHz]	P [dBc]	Result
5374.000	-33.87	PASSED
7824.000	-35.52	PASSED
11652.000	-35.87	PASSED

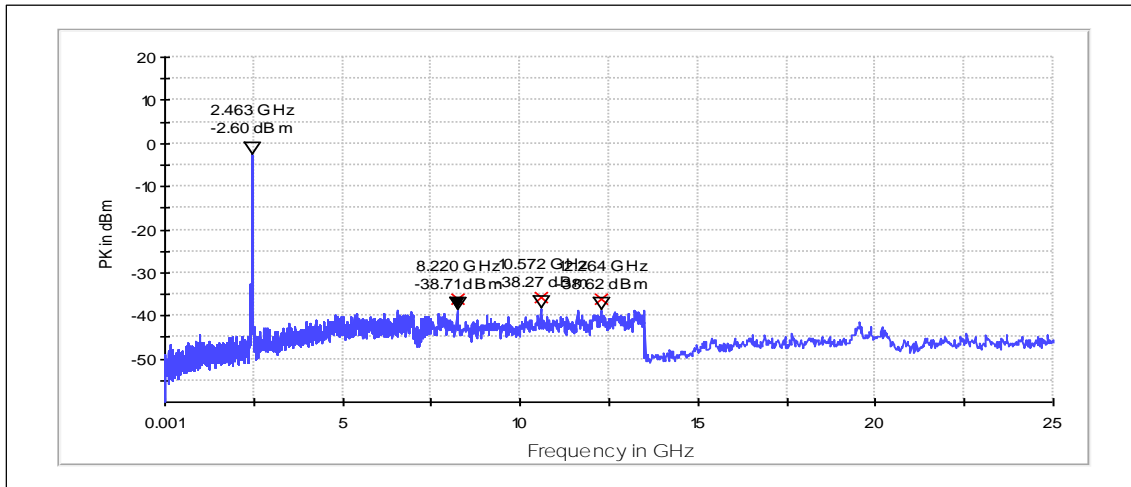
Channel 4-8 / 2437 MHz



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

Frequency [MHz]	P [dBc]	Result
12348.000	-38.58	PASSED
13332.000	-38.67	PASSED
10308.000	-38.80	PASSED

Channel 7-11 / 2452 MHz



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

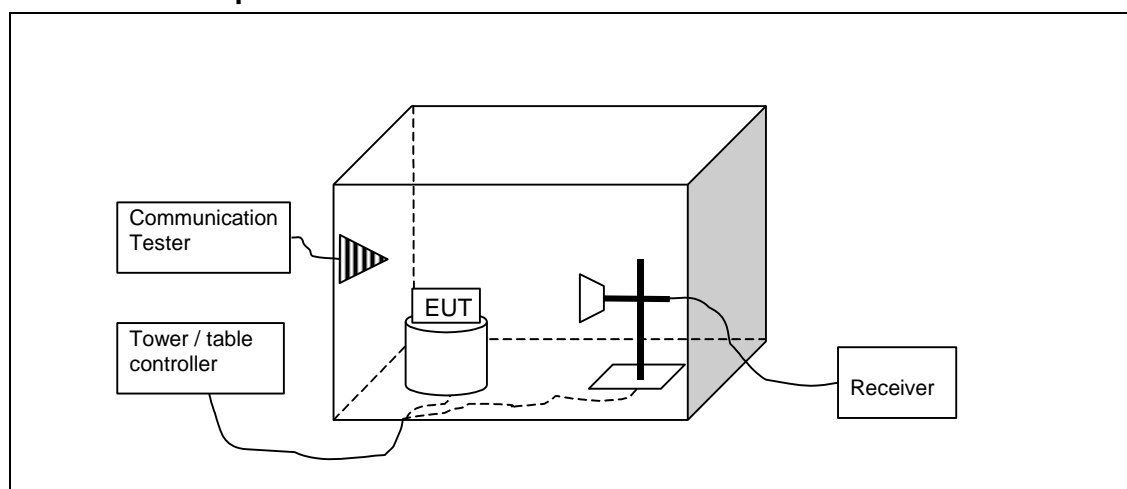
Frequency [MHz]	P [dBc]	Result
10572.000	-35.68	PASSED
12264.000	-36.02	PASSED
8220.000	-36.11	PASSED



## 6. Spurious radiated emissions

<b>EUT with DUT number</b>	RM-1152, DUT 400049
<b>Accessories with DUT numbers</b>	BV-T3G (LG), DUT 400051 ; AC-18E, DUT 400050 ; WH-108, DUT 42927
<b>Operation Voltage [V] / [Hz]</b>	115 / 60
<b>Results</b>	PASSED
<b>Remarks</b>	-
<b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b>	21/40/100
<b>Date of measurements</b>	12-Nov-2015
<b>Measured by</b>	Hannu Söderholm

### 6.1.1 Test setup



## 6.2. Test method and limit

The measurement is made according to ANSI C63.10 and RSS-247 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, measuring antenna at fixed height and EUT set in three orthogonal positions on the turn table.

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.

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

### 6.3. WLAN test results, Orthogonal position 1 and 2

#### 6.3.1 802.11g, 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 <sub>RX</sub> [dBμV]	A <sub>TOT</sub> [dB]	Limit [dBμV/m]	Margin	Results
4823.9	44.55	168.85	48.55	-4	74	29.43	PASSED
7237.2	45.93	197.925	44.13	1.8	95	49.3	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U <sub>RX</sub> [dBμV]	A <sub>TOT</sub> [dB]	Limit [dBμV/m]	Margin	Results
4823.9	31.14	36.058	35.14	-4	54	22.84	PASSED
7237.2	32.76	43.451	30.96	1.8	---	---	PASSED

Channel 6 / 2437 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U <sub>RX</sub> [dBμV]	A <sub>TOT</sub> [dB]	Limit [dBμV/m]	Margin	Results
35.878	25.28	18.365	48.18	-22.9	40	14.72	PASSED
945.935	34.19	51.227	49.19	-15	46	11.83	PASSED
956.074	34.33	52.06	49.43	-15.1	46	11.69	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U <sub>RX</sub> [dBμV]	A <sub>TOT</sub> [dB]	Limit [dBμV/m]	Margin	Results
4878	48.18	256.448	52.18	-4	74	25.8	PASSED
7319.8	46.45	210.136	44.45	2	74	27.53	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U <sub>RX</sub> [dBμV]	A <sub>TOT</sub> [dB]	Limit [dBμV/m]	Margin	Results
4878	33.82	49.091	37.82	-4	54	20.16	PASSED
7319.8	33.51	47.37	31.51	2	54	20.47	PASSED

Channel 11 / 2462 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U <sub>RX</sub> [dBμV]	A <sub>TOT</sub> [dB]	Limit [dBμV/m]	Margin	Results
4925.8	44.05	159.404	48.05	-4	74	29.93	PASSED
7385.3	46.33	207.253	44.03	2.3	74	27.65	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U <sub>RX</sub> [dBμV]	A <sub>TOT</sub> [dB]	Limit [dBμV/m]	Margin	Results
4925.8	31.05	35.686	35.05	-4	54	22.93	PASSED
7385.3	33.21	45.761	30.91	2.3	54	20.77	PASSED

### 6.3.2 802.11g, 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 <sub>RX</sub> [dBμV]	A <sub>TOT</sub> [dB]	Limit [dBμV/m]	Margin	Results
4825.9	44.04	159.221	48.04	-4	74	29.94	PASSED
7235.3	45.8	194.984	44	1.8	95	49.43	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U <sub>RX</sub> [dBμV]	A <sub>TOT</sub> [dB]	Limit [dBμV/m]	Margin	Results
4825.9	30.72	34.356	34.72	-4	54	23.26	PASSED
7235.3	32.77	43.501	30.97	1.8	---	---	PASSED

Channel 6 / 2437 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U <sub>RX</sub> [dBμV]	A <sub>TOT</sub> [dB]	Limit [dBμV/m]	Margin	Results
35.638	24.95	17.681	47.75	-22.8	40	15.05	PASSED
911.665	22.47	13.289	37.67	-15.2	46	23.55	PASSED
946.025	34.62	53.827	49.62	-15	46	11.4	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U <sub>RX</sub> [dBμV]	A <sub>TOT</sub> [dB]	Limit [dBμV/m]	Margin	Results
4878.5	46.17	203.47	50.17	-4	74	27.81	PASSED
7321.9	47.78	244.906	45.68	2.1	74	26.2	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U <sub>RX</sub> [dBμV]	A <sub>TOT</sub> [dB]	Limit [dBμV/m]	Margin	Results
4878.5	32.86	43.954	36.86	-4	54	21.12	PASSED
7321.9	33.42	46.881	31.32	2.1	54	20.56	PASSED

Channel 11 / 2462 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U <sub>RX</sub> [dBμV]	A <sub>TOT</sub> [dB]	Limit [dBμV/m]	Margin	Results
4923.9	44.7	171.791	48.7	-4	74	29.28	PASSED
7386.1	46.08	201.372	43.78	2.3	74	27.9	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U <sub>RX</sub> [dBμV]	A <sub>TOT</sub> [dB]	Limit [dBμV/m]	Margin	Results
4923.9	32.44	41.879	36.44	-4	54	21.54	PASSED
7386.1	33.11	45.238	30.81	2.3	54	20.87	PASSED

## 6.4. WLAN test results, Orthogonal position 3

### 6.4.1 802.11g, BPSK modulation, 6 Mbps data rate.

Channel 1 / 2412 MHz

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

Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Limit [dB $\mu$ V/m]	Margin	Results
4823.7	44.43	166.533	48.43	-4	74	29.55	PASSED
7235.5	45.39	185.994	43.59	1.8	95	49.84	PASSED

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

Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Limit [dB $\mu$ V/m]	Margin	Results
4823.7	30.98	35.4	34.98	-4	54	23	PASSED
7235.5	32.76	43.451	30.96	1.8	---	---	PASSED

Channel 6 / 2437 MHz

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

Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Limit [dB $\mu$ V/m]	Margin	Results
31.65	15.12	5.702	36.22	-21.1	40	24.88	PASSED
35.608	25.17	18.134	47.97	-22.8	40	14.83	PASSED
945.935	34.11	50.757	49.11	-15	46	11.91	PASSED

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

Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Limit [dB $\mu$ V/m]	Margin	Results
4879.9	43.44	148.594	47.44	-4	74	30.54	PASSED
7318.2	46.29	206.3	44.29	2	74	27.69	PASSED

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

Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Limit [dB $\mu$ V/m]	Margin	Results
4879.9	29.82	30.974	33.82	-4	54	24.16	PASSED
7318.2	32.95	44.412	30.95	2	54	21.03	PASSED

Channel 11 / 2462 MHz

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

Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Limit [dB $\mu$ V/m]	Margin	Results
4925.5	40.81	109.774	44.81	-4	74	33.17	PASSED
7386	46.9	221.309	44.6	2.3	74	27.08	PASSED

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

Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Limit [dB $\mu$ V/m]	Margin	Results
4925.5	27.96	25.003	31.96	-4	54	26.02	PASSED
7386	33.14	45.394	30.84	2.3	54	20.84	PASSED

## 6.4.2 802.11g, 16QAM modulation, 24 Mbps data rate.

Channel 1 / 2412 MHz

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

Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Limit [dB $\mu$ V/m]	Margin	Results
4823.8	43.44	148.594	47.44	-4	74	30.54	PASSED
7235	46.08	201.372	44.28	1.8	95	49.15	PASSED

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

Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Limit [dB $\mu$ V/m]	Margin	Results
4823.8	30.17	32.248	34.17	-4	54	23.81	PASSED
7235	32.79	43.601	30.99	1.8	---	---	PASSED

Channel 6 / 2437 MHz

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

Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Limit [dB $\mu$ V/m]	Margin	Results
30.39	23.06	14.223	43.66	-20.6	40	16.94	PASSED
911.515	22.47	13.289	37.67	-15.2	46	23.55	PASSED
945.935	35.08	56.754	50.08	-15	46	10.94	PASSED

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

Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Limit [dB $\mu$ V/m]	Margin	Results
4879.1	43.94	157.398	47.94	-4	74	30.04	PASSED
7321.6	45.79	194.76	43.79	2	74	28.19	PASSED

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

Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Limit [dB $\mu$ V/m]	Margin	Results
4879.1	30.16	32.211	34.16	-4	54	23.82	PASSED
7321.6	32.99	44.617	30.99	2	54	20.99	PASSED

Channel 11 / 2462 MHz

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

Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Limit [dB $\mu$ V/m]	Margin	Results
4923.2	43.59	151.182	47.59	-4	74	30.39	PASSED
7385.4	45.92	197.697	43.62	2.3	74	28.06	PASSED

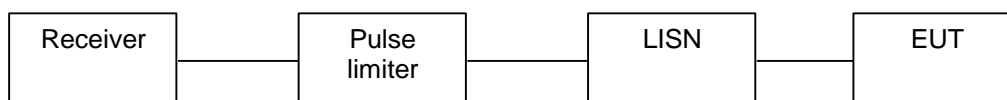
Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dB $\mu$ V/m]	E [ $\mu$ V/m]	U <sub>RX</sub> [dB $\mu$ V]	A <sub>TOT</sub> [dB]	Limit [dB $\mu$ V/m]	Margin	Results
4923.2	30.16	32.211	34.16	-4	54	23.82	PASSED
7385.4	33.21	45.761	30.91	2.3	54	20.77	PASSED

## 7. AC powerline conducted emissions

<b>EUT with DUT number</b>	RM-1152, DUT 400049
<b>Accessories with DUT numbers</b>	AC-18E, DUT 400050 ; BV-T3G (LG), DUT 400051 ; WH-108, DUT 42927
<b>Operation Voltage [V] / [Hz]</b>	Nominal
<b>Results</b>	PASSED
<b>Remarks</b>	-
<b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b>	21 / 40 / 101.5
<b>Date of measurements</b>	03-Nov-2015
<b>Measured by</b>	Hannu Söderholm

### 7.1. Test Setup



### 7.2. Test method and limit

The measurement is made according to ANSI C63.10 and 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.

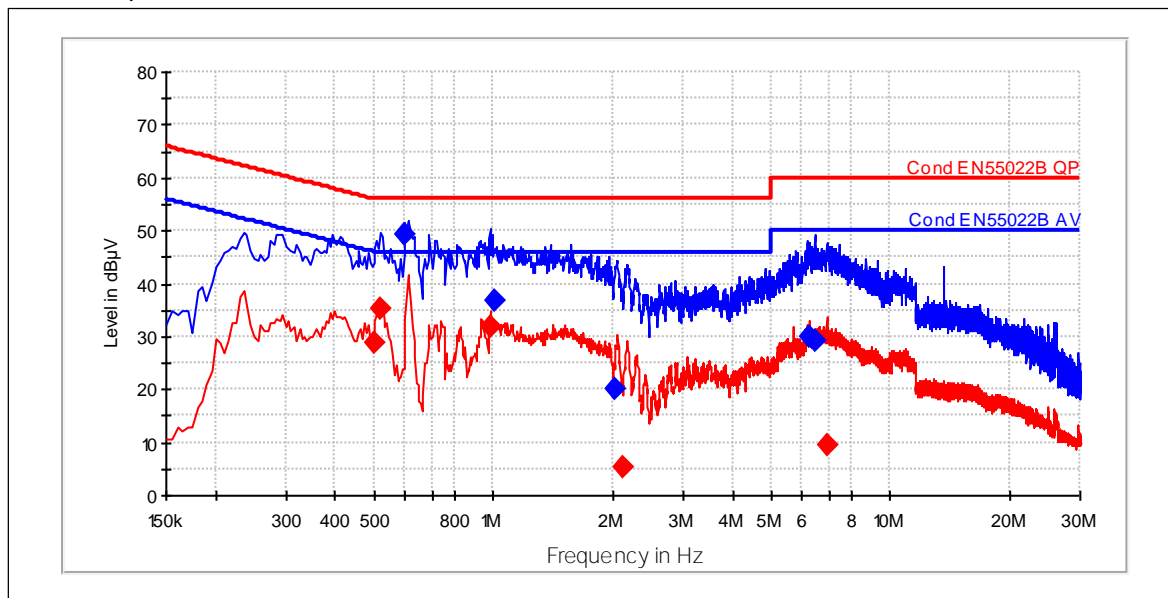
#### CISPR 22 Class B limits

Frequency range [MHz]	Quasi peak limit [dB $\mu$ V]	Average limit [dB $\mu$ V]
0.15 - 0.5	66 - 56	56 - 46
0.5 - 5	56	46
5 - 30	60	50

### 7.3. WLAN Test results

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

Channel 6 / 2437 MHz



#### QuasiPeak

Frequency [MHz]	QuasiPeak [dBµV]	Limit [dBµV]	Margin [dB]	Line	Results
0.595	49.38	56	6.62	L1	PASSED
1.01	36.63	56	19.37	L1	PASSED
2.035	20.2	56	35.8	L1	PASSED
6.285	29.95	60	30.05	L1	PASSED
6.45	29.01	60	30.99	L1	PASSED

#### Average

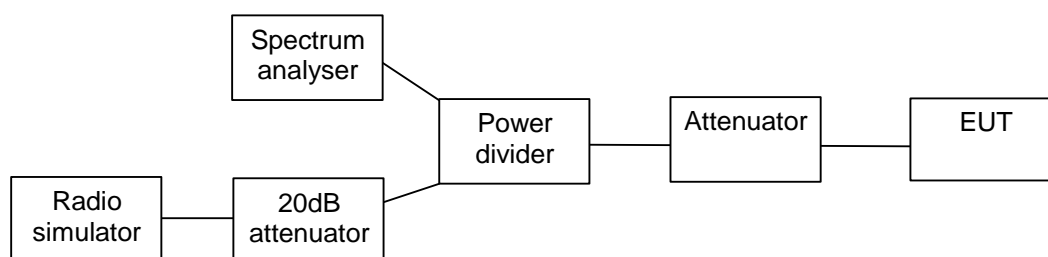
Frequency [MHz]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	Results
0.505	28.64	46	17.36	L1	PASSED
0.52	35.3	46	10.7	L1	PASSED
0.985	32.02	46	13.98	L1	PASSED
2.13	5.45	46	40.55	L1	PASSED
6.94	9.4	50	40.6	L1	PASSED



## 8. 6dB (bandwidth)

<b>EUT with DUT number</b>	RM-1152, DUT 400052
<b>Accessories with DUT numbers</b>	SD-134, DUT 400053
<b>Operation Voltage [V] / [Hz]</b>	Nominal
<b>Results</b>	PASSED
<b>Remarks</b>	RF Cond 2
<b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b>	22 / 45 / 100
<b>Date of measurements</b>	27-Oct-2015
<b>Measured by</b>	Hannu Soderholm

### 8.1. Test Setup



### 8.2. Test method and limit

The measurement is made according to ANSI C63.10 and RSS-247.

Limits for 6 dB bandwidth measurements

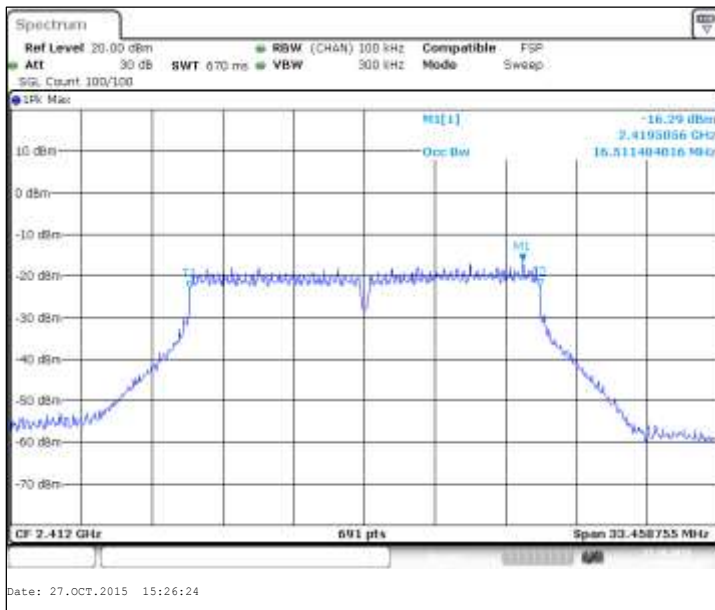
Limit [kHz]
>= 500

### 8.3. WLAN Test results

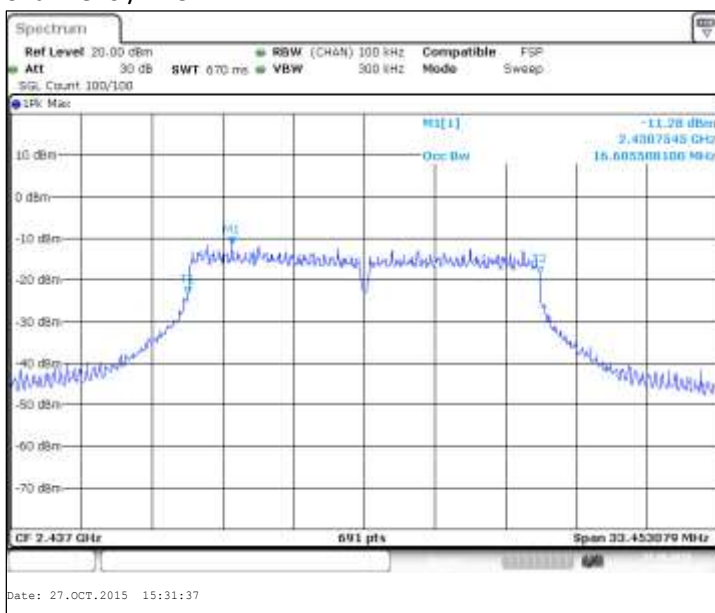
#### 8.3.1 802.11g Main mode, BPSK modulation, 6 Mbps data rate

Channel / fc [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	16511.5	PASSED
6 / 2437	16605.5	PASSED
11 / 2462	16557.3	PASSED

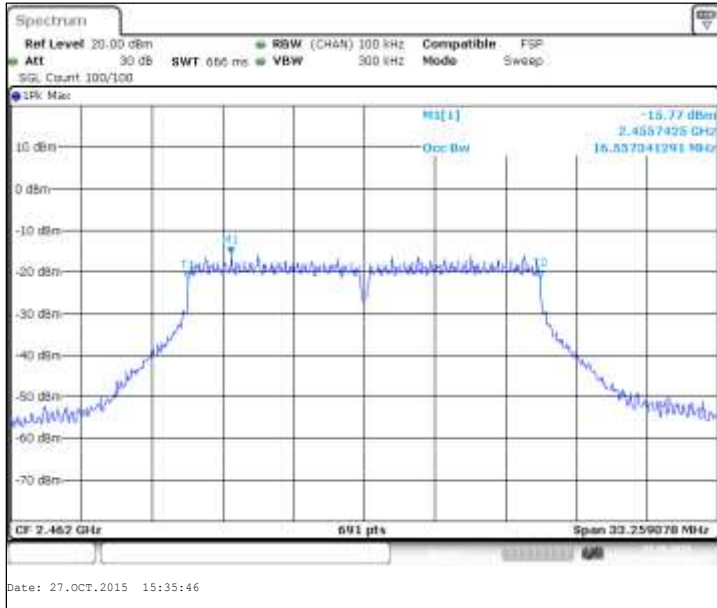
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



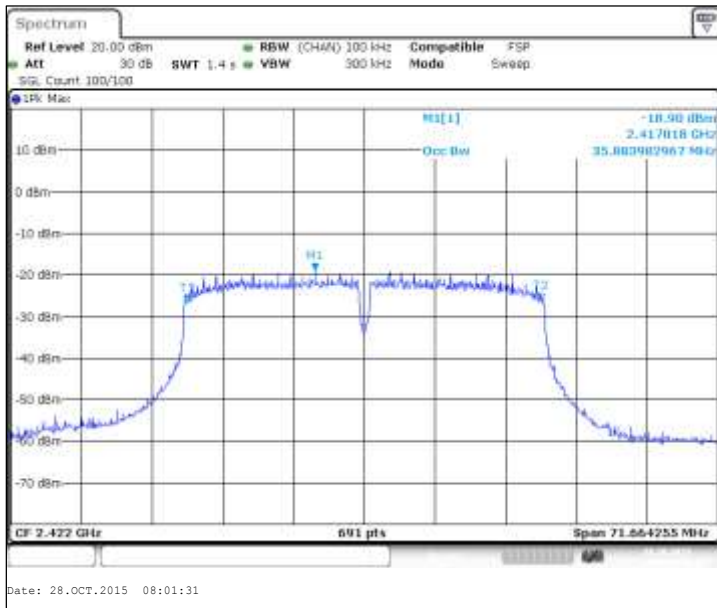
Channel 11 / 2462 MHz



8.3.2 802.11n Main mode, BPSK modulation, 13.5 / 15 Mbps data rate

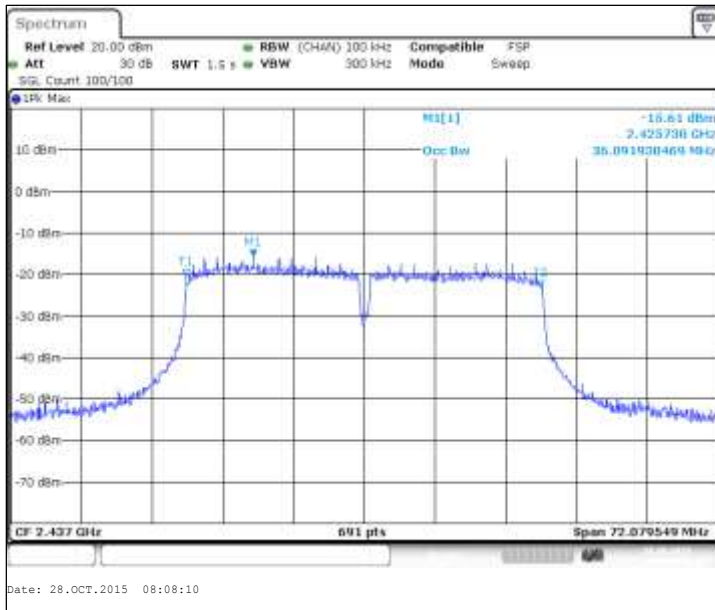
Channel / f <sub>c</sub> [MHz]	6 dB bandwidth [kHz]	Result
1-5 / 2422	35884	PASSED
4-8 / 2437	36091.9	PASSED
7-11 / 2452	36195.3	PASSED

Channel 1-5 / 2422 MHz

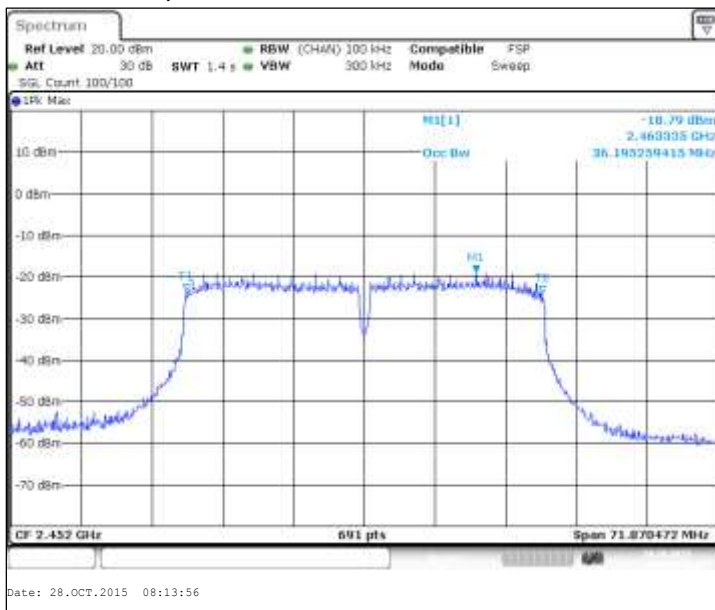


Channel 4-8 / 2437 MHz

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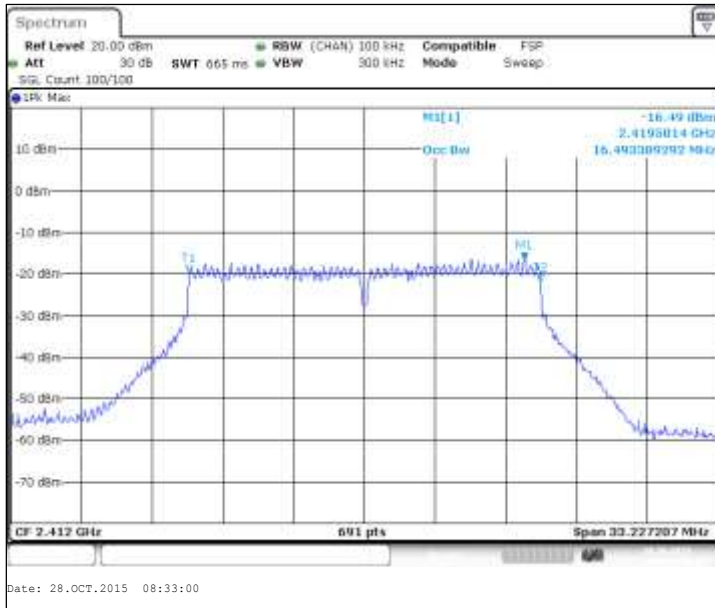
Channel 7-11 / 2452 MHz



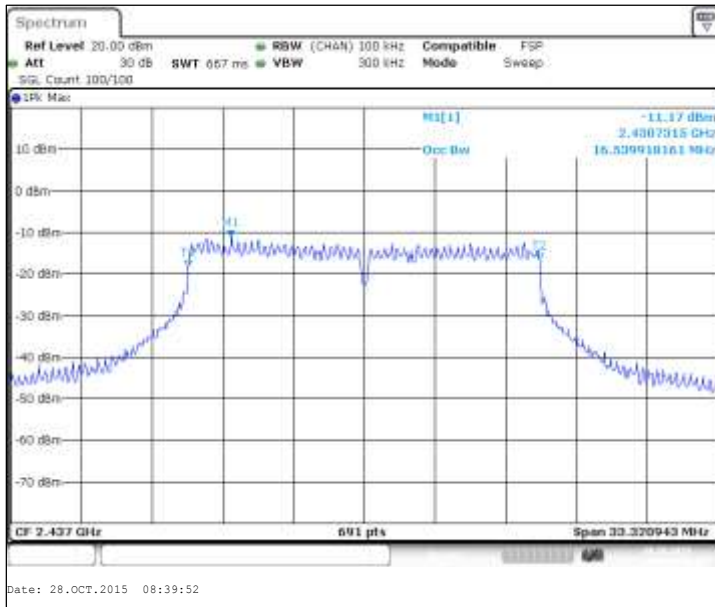
### 8.3.3 802.11g Main mode, 16QAM modulation, 24 Mbps data rate

Channel / f <sub>c</sub> [MHz]	6 dB bandwidth [kHz]	Result
1 / 2412	16493.4	PASSED
6 / 2437	16539.9	PASSED
11 / 2462	16443.4	PASSED

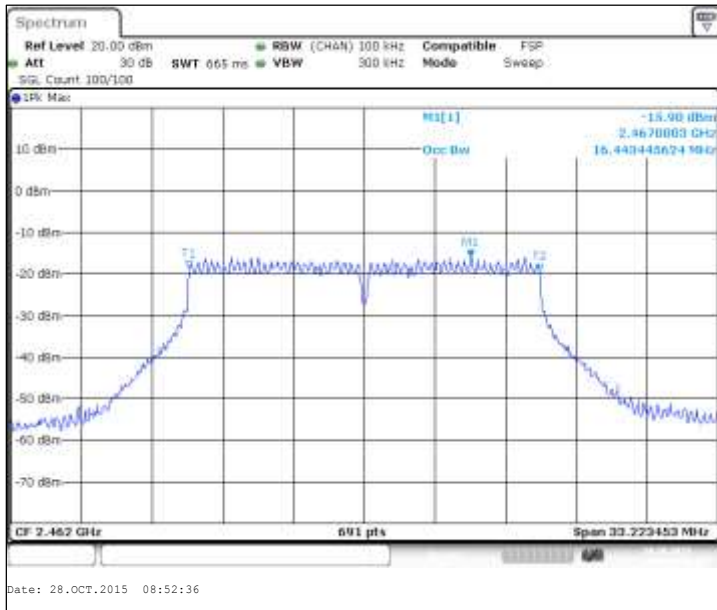
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



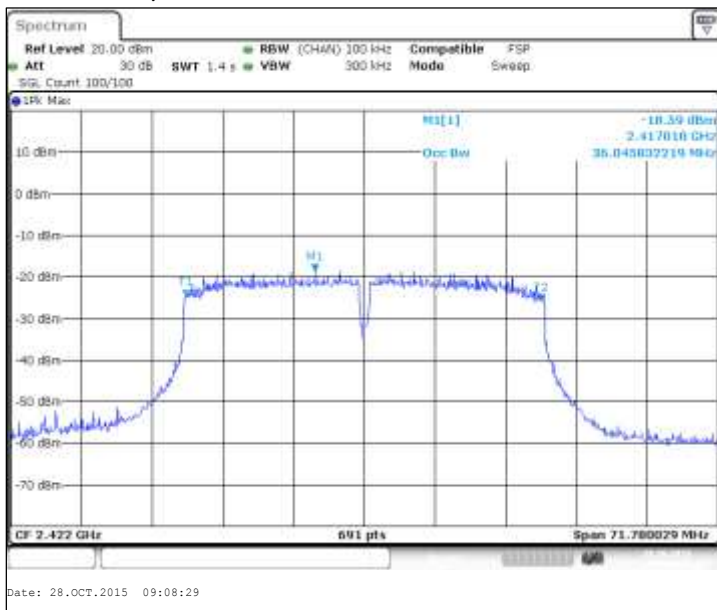
Channel 11 / 2462 MHz



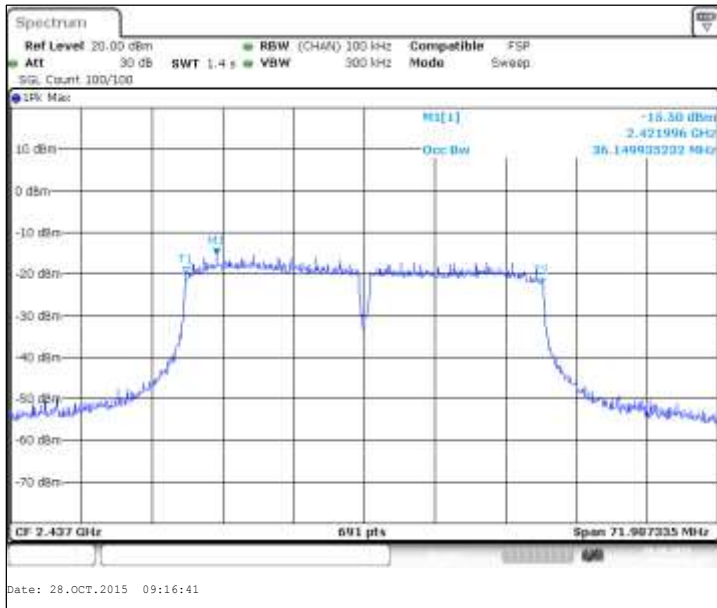
8.3.4 802.11n Main mode, 16QAM modulation, 54 / 60 Mbps data rate

Channel / f <sub>c</sub> [MHz]	6 dB bandwidth [kHz]	Result
1-5 / 2422	36045.8	PASSED
4-8 / 2437	36149.9	PASSED
7-11 / 2452	36149.9	PASSED

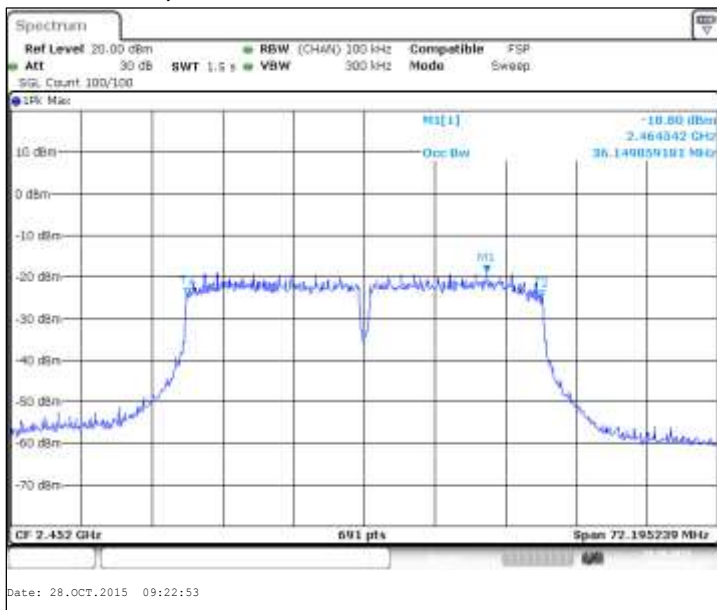
Channel 1-5 / 2422 MHz



Channel 4-8 / 2437 MHz



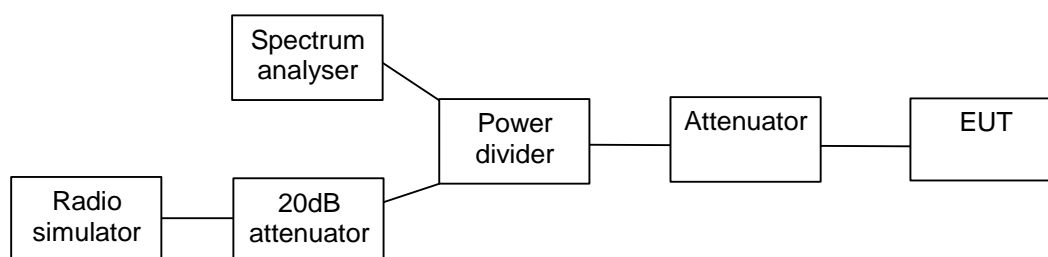
Channel 7-11 / 2452 MHz



## 9. Power spectral density

<b>EUT with DUT number</b>	RM-1152, DUT 400052
<b>Accessories with DUT numbers</b>	SD-134, DUT 400053
<b>Operation Voltage [V] / [Hz]</b>	Nominal
<b>Results</b>	PASSED
<b>Remarks</b>	RF Cond 2
<b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b>	22 / 45 / 100
<b>Date of measurements</b>	27-Oct-2015
<b>Measured by</b>	Hannu Soderholm

### 9.1. Test Setup



### 9.2. Test method and limit

The measurement is made according to ANSI C63.10 and RSS-247.

Limits for power spectral density measurements

Limit [dBm] @ 3 kHz
<= 8



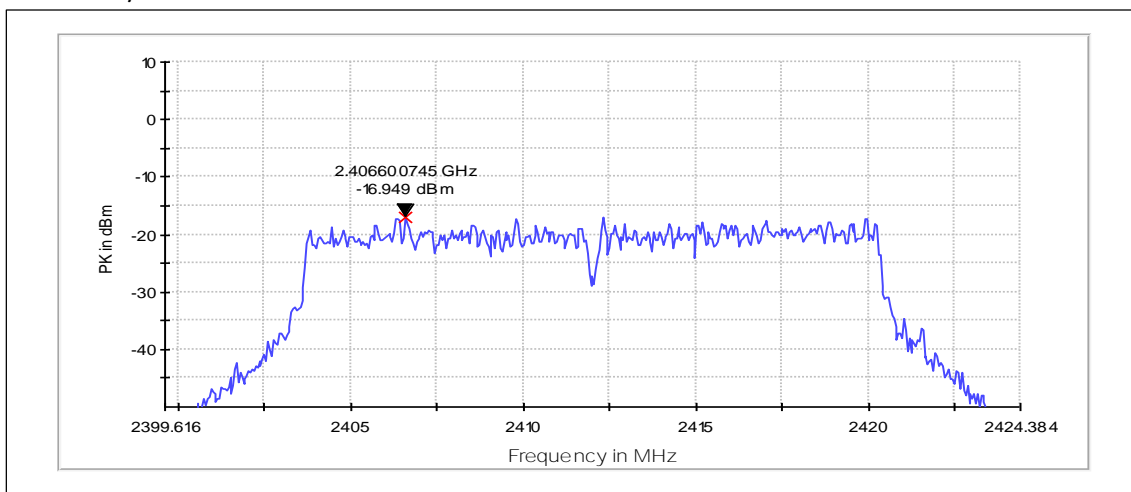
### 9.3. WLAN Test results

#### 9.3.1 802.11g Main mode, BPSK modulation, 6 Mbps data rate

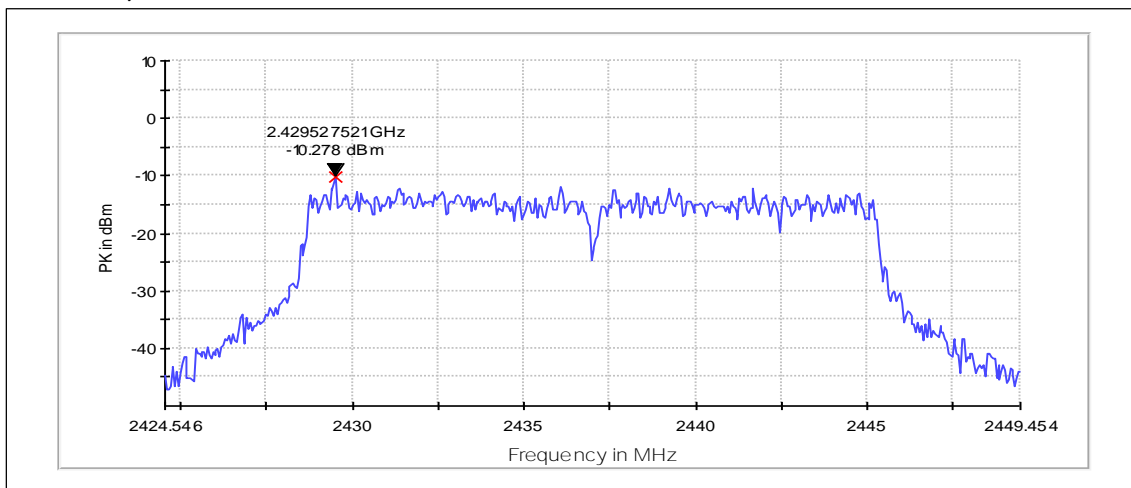
Peak (RBW: 3 kHz, VBW: 10 kHz, Max hold)

Channel / fc [MHz]	P [dBm]	Result
1 / 2412	-16.95	PASSED
6 / 2437	-10.28	PASSED
11 / 2462	-14.08	PASSED

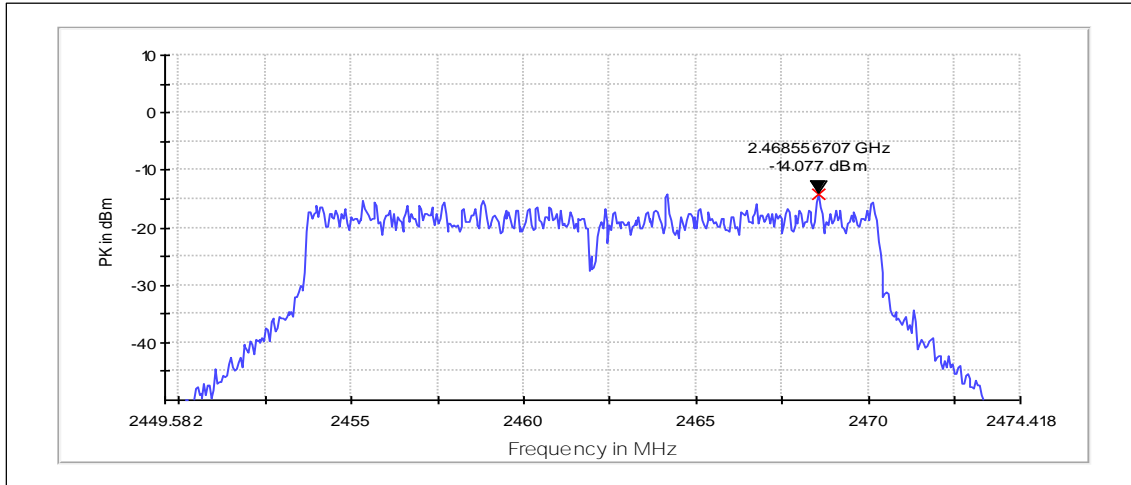
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



Channel 11 / 2462 MHz

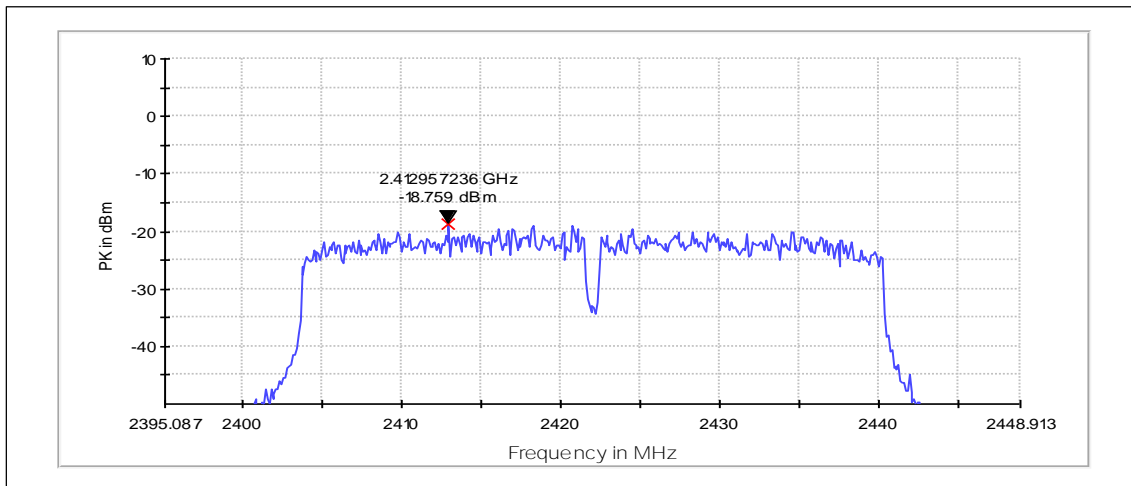


**9.3.2 802.11n Main mode, BPSK modulation, 13.5 / 15 Mbps data rate**

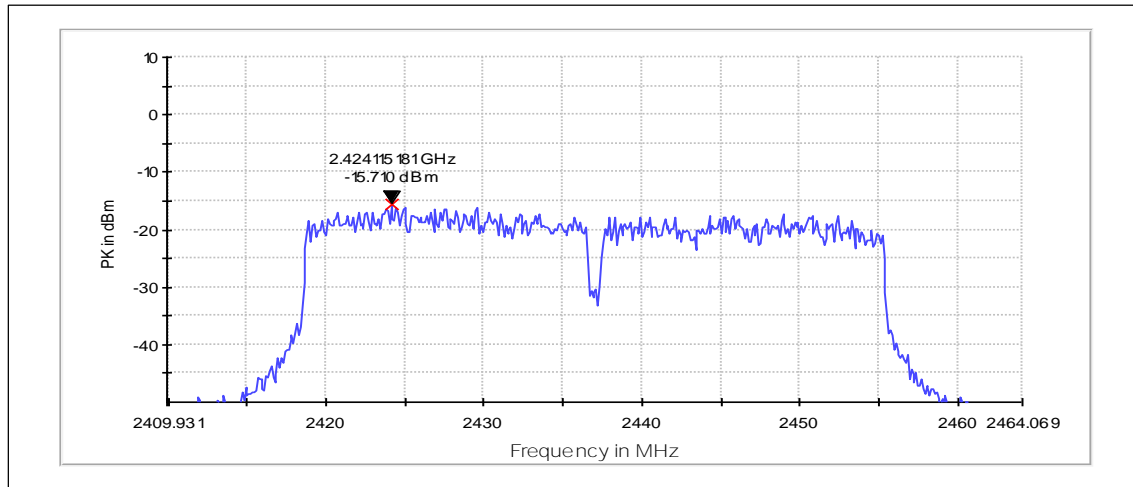
Peak (RBW: 3 kHz, VBW: 10 kHz, Max hold)

Channel / f <sub>c</sub> [MHz]	P [dBm]	Result
1-5 / 2422	-18.76	PASSED
4-8 / 2437	-15.71	PASSED
7-11 / 2452	-18.04	PASSED

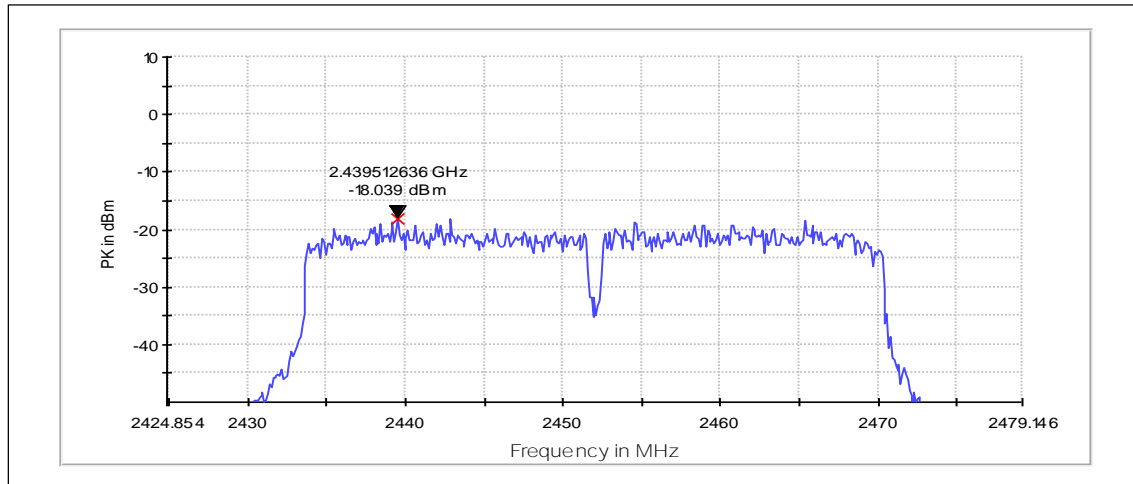
Channel 1-5 / 2422 MHz



Channel 4-8 / 2437 MHz



Channel 7-11 / 2452 MHz

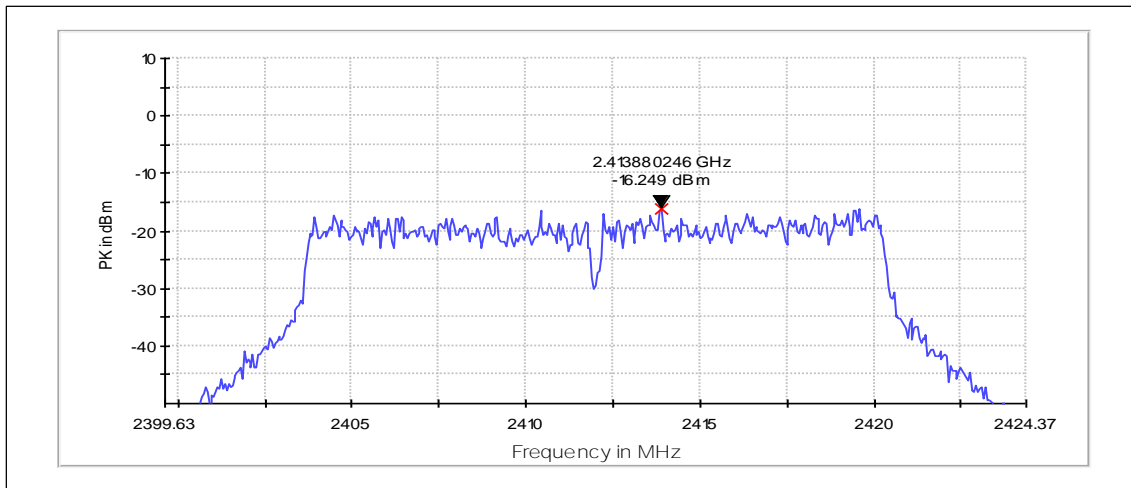


### 9.3.3 802.11g Main mode, 16QAM modulation, 24 Mbps data rate

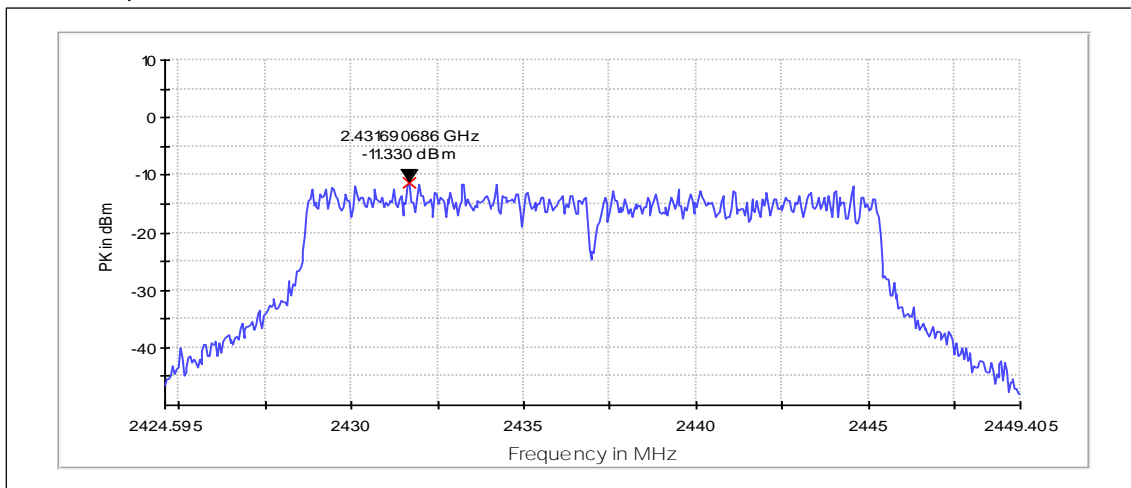
Peak (RBW: 3 kHz, VBW: 10 kHz, Max hold)

Channel / f <sub>c</sub> [MHz]	P [dBm]	Result
1 / 2412	-16.25	PASSED
6 / 2437	-11.33	PASSED
11 / 2462	-15.08	PASSED

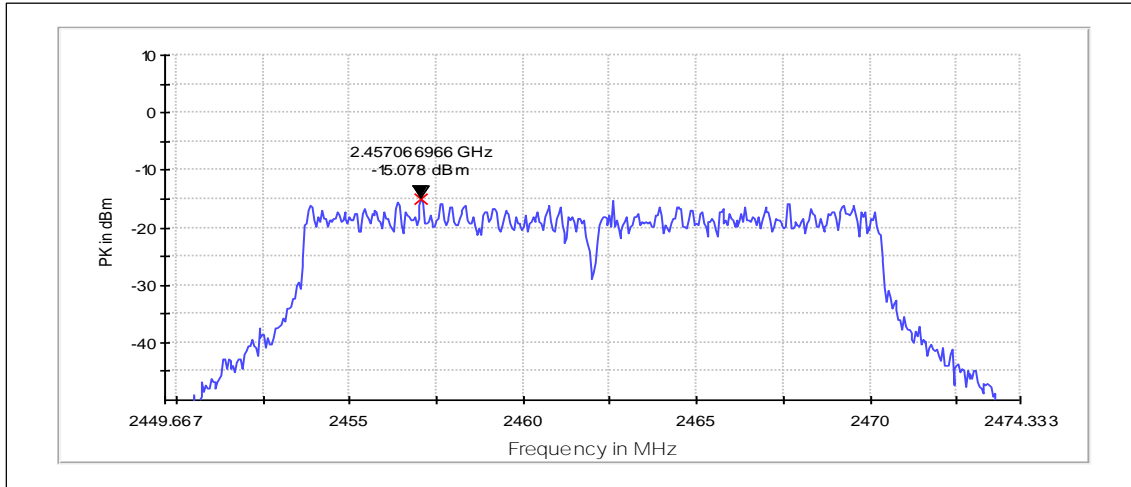
Channel 1 / 2412 MHz



Channel 6 / 2437 MHz



Channel 11 / 2462 MHz

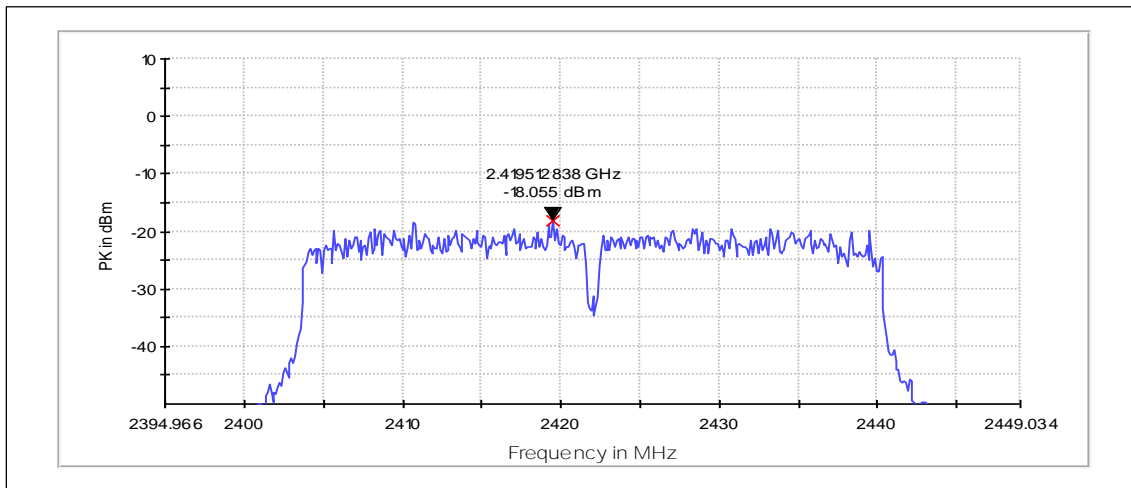


9.3.4 802.11n Main mode, 16QAM modulation, 54 / 60 Mbps data rate

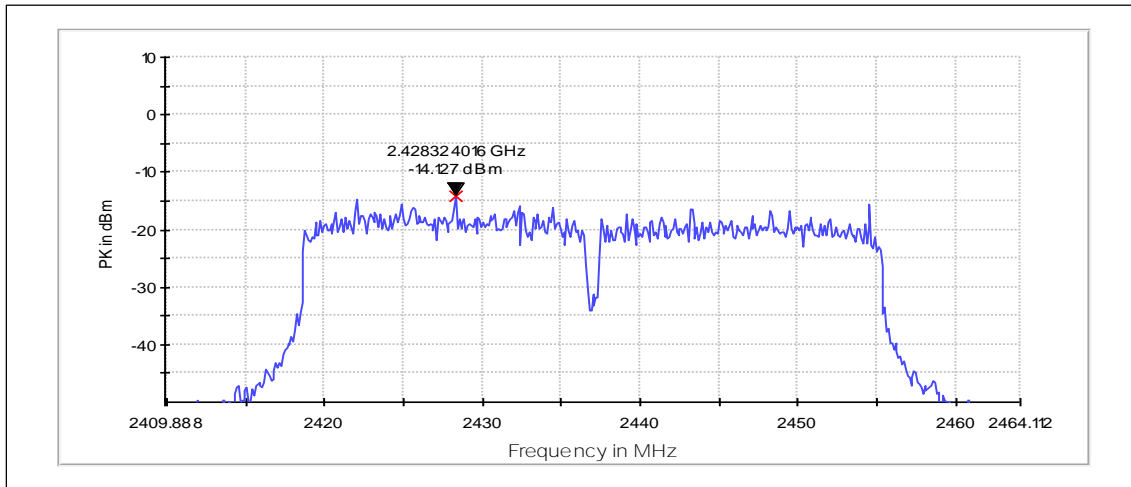
Peak (RBW: 3 kHz, VBW: 10 kHz, Max hold)

Channel / f <sub>c</sub> [MHz]	P [dBm]	Result
1-5 / 2422	-18.06	PASSED
4-8 / 2437	-14.13	PASSED
7-11 / 2452	-17	PASSED

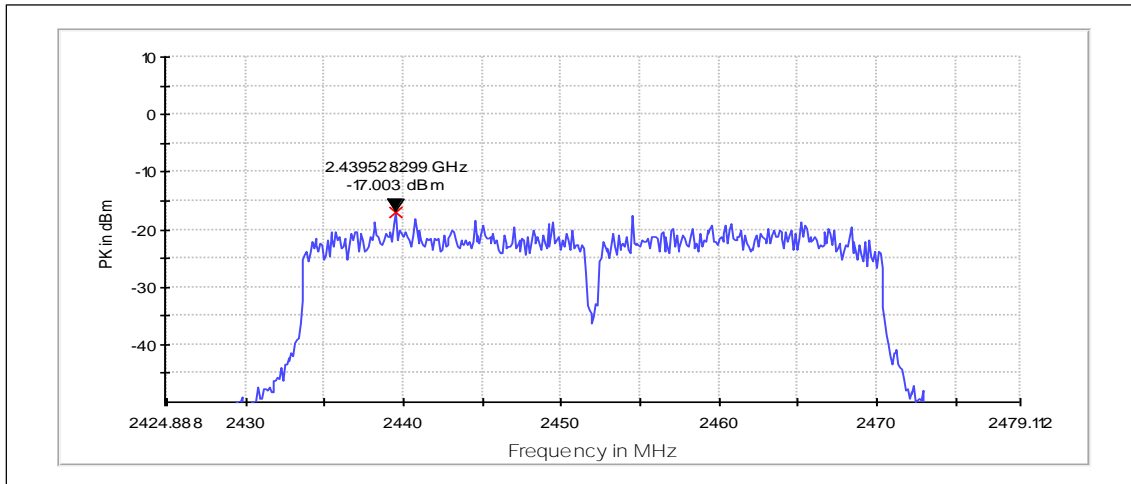
Channel 1-5 / 2422 MHz



Channel 4-8 / 2437 MHz



Channel 7-11 / 2452 MHz



## 10. Test Equipment

The calibration dates for all test equipment are maintained in the equipment register. The register alerts the test lab about expired calibrations. Therefore, tests are always done with calibrated equipment. The dates are provided by request.

### 10.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM350089	Power supply	6632A	Agilent	22/24/27, 15C, 15E
TM350090	Power supply	6632A	Agilent	22/24/27, 15C, 15E
TM30600	Impulse limiter	ESH3-Z2	R&S	15C, 15B
TM490017	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM490018	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM150128	Spectrum Analyzer	F5U26	R&S	22/24/27, 15C, 15E
TM23007	Oscilloscope	TDS684B	Tektronix	15E
TM22806	Battery	BAT 20/E	Fiskars	15C, 15B
TM22805	UPS	PS 20/1.2	Fiskars	15C, 15B
-	Temperature and humidity logger	175-H2	Testo	15C, 15B
-	Temperature and humidity logger	175-H2	Testo	22/24/27, 15C
-	Air pressure and temperature logger	635-2	Testo	22/24/27, 15C, 15B
-	Air pressure sensor	0638-1835	Testo	22/24/27, 15C, 15B
-	Temperature test chamber	VT 4002	Vötsch	22/24/27
2001	Bluetooth tester	CBT	R&S	15C, 15B
2009	LISN 50 µH	ENV216	R&S	15C, 15B
2010	LISN 50 µH	ENV216	R&S	15C, 15B
2012	Power splitter	11667B	Agilent	22/24/27, 15C
2013	Attenuator	8493C	Agilent	22/24/27, 15C
2014	Attenuator	8493C	Agilent	22/24/27, 15C
2019	Power splitter	ZN2PD-9G-S+	Mini-Circuits	15E
2020	Power splitter	ZN2PD-9G-S+	Mini-Circuits	15E
TM210166	Communication Tester	CMW500	R&S	22/24/27
TM210205	Communication Tester	CMU200	R&S	22/24/27
2023	Spectrum Analyzer	ESMI-RF	R&S	15B/15C
2024	Analyzer display unit	ESAI-D	R&S	15B/15C
TM110070	Signal Generator	SMF 100A	R&S	22/24/27, 15C, 15E, 15B
TM220065	Bluetooth tester	CBT	R&S	15C, 15B
TM210330	Communication Tester	CMU200	R&S	22/24/27, 15B
TM150131	Spectrum Analyzer	FSP30	R&S	22/24/27, 15C, 15E
TM210049	Communication Tester	CMU200	R&S	22/24/27

## 10.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
-	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C
TM38845	Receiver	ESIB 26	R&S	22/24/27, 15C, 15E, 15B
-	Antenna	HL562	R&S	22/24/27, 15C, 15E, 15B
-	Turntable	2188	EMCO	22/24/27, 15C, 15E, 15B
-	Turntable controller	2090	EMCO	22/24/27, 15C, 15E, 15B
-	RF system panel	OSP130	R&S	22/24/27, 15C, 15E, 15B
-	Mini mast	2075-2	ETS Lindgren	22/24/27, 15C, 15B
TM38843	Mini mast	2075	Emco	22/24/27, 15C, 15B
TM38842	Antenna mast controller	2090	Emco	22/24/27, 15C, 15B
TM30643	LISN 50 µH	LISN-5-20-2	FCC	22/24/27, 15C, 15B
TM30644	LISN 50 µH	LISN-5-20-2	FCC	22/24/27, 15C, 15B
-	Temperature and humidity logger	175-H2	Testo	22/24/27, 15C, 15B
-	Air pressure and temperature logger	635-2	Testo	22/24/27, 15C, 15B
-	Air pressure sensor	0638-1835	Testo	22/24/27, 15C, 15B
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	Miteq	22/24/27, 15C, 15B
TM37498	Preamplifier	AMF-5D-020180-26-10P	Miteq	22/24/27, 15C, 15B
TM30599	Semi anechoic chamber	UNKNOWN	TDK	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	-	22/24/27, 15C, 15E, 15B
TM38066	High pass filter	WHKX3.0/18G-12SS	Wainwright	22/24/27, 15C, 15E, 15B
2028	High pass filter	WHKX 1.0/15G-12SS	Wainwright	22/24/27, 15C, 15E, 15B
TM37545	Tunable notch filter	800.0/960.0-0.2/40-8SSK	Wainwright	22
TM26512	Tunable notch filter	WRCD1850/1910-0.2/40-10SSK	Wainwright	24
-	Band reject filter	WRCG1877/1883-1870/1890-40/6EE	Wainwright	24
-	Band reject filter	WRCG1729.4/1735.4-1722.4/1742.4-40/6SS	Wainwright	27
TM23892	Controller	G-1000SDX	Yaesu	22/24/27, 15C, 15E
2001	Bluetooth tester	CBT	R&S	15C, 15B
TM210203	Communication Tester	CMU200	R&S	22/24/27, 15B
6023	Antenna	VUBA 9117	Schwarzbeck	22/24/27
TM210166	Communication Tester	CMW500	R&S	22/24/27
2025	Antenna	HFH2-Z2	R&S	15C
TM110070	Signal Generator	SMF 100A	R&S	22/24/27, 15C, 15E, 15B
2052	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C, 15B, 15E
-	Antenna	QSH18S20	Q-Par	22/24/27, 15C, 15B, 15E
-	Antenna	QSH20S20	Q-Par	22/24/27, 15C, 15B, 15E
-	Antenna	QSH20S20	Q-Par	22/24/27, 15C, 15B, 15E
TM220065	Bluetooth tester	CBT	R&S	15C, 15B

# END OF REPORT