

FCC Part 15C Compliance Test Report

Test Report no.:	FCC15C_RM-639_03.doc	Date of Report:	03-Jun-2010
Number of pages:	40	Customer's Contact person:	Ralph Schwarz
Testing laboratory:	TCC Nokia Tampere Laboratory P.O. Box 68 Sinitaival 5 FIN-33720 TAMPERE, FINLAND Tel. +358 (0) 7180 46800 Fax. +358 (0) 7180 46880	Customer:	Nokia Corporation Lise Meitner Strasse 10 89081 ULM GERMANY Tel. +49 731 1754 0 Fax. +49 731 1754 6800
FCC listing no.:	94436		
IC recognition no.:	661AK-1		
Tested devices/ accessories:	Phone RM-639 / Battery BL-4S, AC charger AC-8E, Headset WH-102		
FCC ID:	PPIRM-639	IC:	661U-RM639
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2003), Public Notice DA 00-705, DTS procedures KDB 558074, IC standards RSS-GEN (Issue 2, June 2007) and RSS-210 (Issue 7, June 2007). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test Results:	The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document.		
Date and signature for the contents:			

Hannu Söderholm, Senior engineer, EMC

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	18-May-2010
Testing completed	03-Jun-2010
The customer's contact person	Ralph Schwarz
Test Plan referred to	T:\Projects\RM-639\TestPlan\RS_testplan_RM-639.xls
Notes	-
Document name	FCC15C_RM-639_03.doc

1.1. EUT and Accessory Information

The EUT is a 8-band (GSM850/900/1800/1900 and WCDMA Band I/II(1900)/V(850)/VIII) mobile phone with GPRS, EGPRS, Bluetooth and WLAN. Bluetooth and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-639	004402130974250	0221	-	le5.03	42246
Phone	RM-639	004402130974961	0221	-	le5.03	42247
Battery	BL-4S	3820669472185781739;0670577	-	-	-	42250
Battery	BL-4S	3820669472185781116;0670577	-	-	-	42251
AC charger	AC-8E	4090499301040501979;0675387	-	-	-	42252
Headset	WH-102	06943239464Z1R21419	-	-	-	42254

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)	A8.5	Band edge compliance of RF emissions	PASSED
15.247(d)	A8.5	Spurious RF conducted emissions	PASSED
15.247(d), 15.209	A8.5	Spurious radiated emissions	PASSED
15.207	7.2.2	AC powerline conducted emissions	PASSED
15.247(a)(2)	A8.2 (a)	6 dB bandwidth	PASSED
15.247(e)	A8.2 (b)	Power spectral density	PASSED

PASSED
FAILED
NP

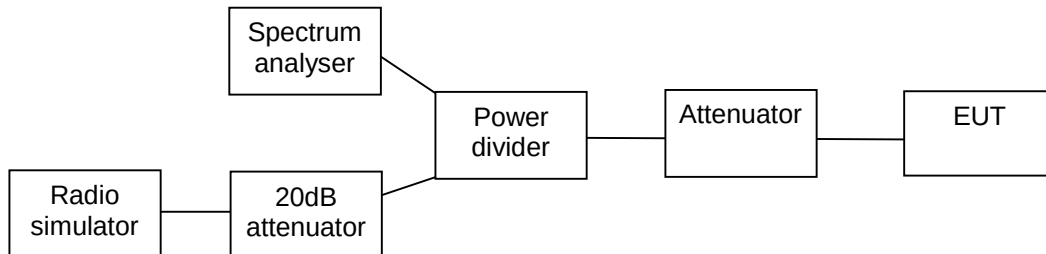
The EUT complies with the essential requirements in the standard.
The EUT does not comply with the essential requirements in the standard.
The test was not performed by the TCC Nokia Tampere Laboratory.

CONTENTS

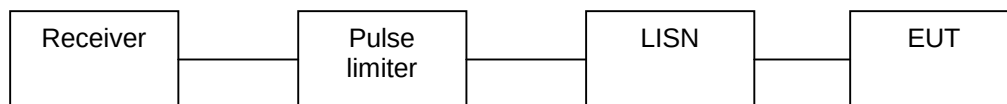
1. Summary for FCC Part 15C Compliance Test Report.....	2
1.1. EUT and Accessory Information	2
1.2. Summary of Test Results	2
2. Test setups.....	4
2.1. Conducted RF test setup	4
2.2. AC powerline conducted emissions test setup.....	4
2.3. Radiated test setup	4
3. Conducted peak output power (FCC §15.247(b)(1), RSS-210 A8.4 (4))	5
3.1. Test method and limit.....	5
3.2. WLAN Test results	6
4. Band edge compliance of RF emissions (FCC §15.247(d), RSS-210 A8.5).....	11
4.1. Test method and limit.....	11
4.2. WLAN Test results	12
5. Spurious RF conducted emissions (FCC §15.247(d), RSS-210 A8.5).....	15
5.1. Test method and limit.....	15
5.2. WLAN Test results	16
6. Spurious radiated emissions (FCC §15.247(d), §15.209, RSS-210 A8.5).....	21
6.1. Test method and limit.....	21
6.2. WLAN Test results	22
7. AC powerline conducted emissions (FCC §15.207, RSS-GEN 7.2.2)	25
7.1. Test method and limit.....	25
7.2. WLAN Test results	26
8. 6 dB bandwidth (FCC §15.247(a)(2), RSS-210 A8.2 (a))	27
8.1. Test method and limit.....	27
8.2. WLAN test results	28
9. Power spectral density (FCC §15.247(e), RSS-210 A8.2 (b))	33
9.1. Test method and limit.....	33
9.2. WLAN test results	34
10. Test Equipment	39
10.1. Conducted measurements	39
10.2. Radiated measurements	39

2. Test setups

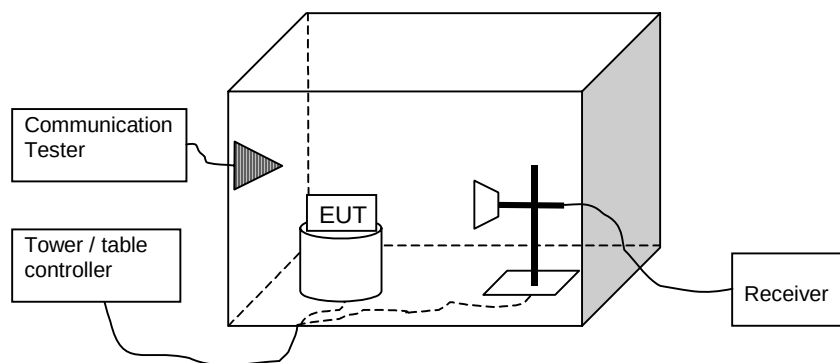
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Radiated test setup



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

EUT with DUT number	RM-639 DUT42247
Accessories with DUT numbers	BL-4S DUT42251
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 46 / 99.2
Date of measurements	24-May-2010
Measured by	Jari Jantunen

3.1. 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

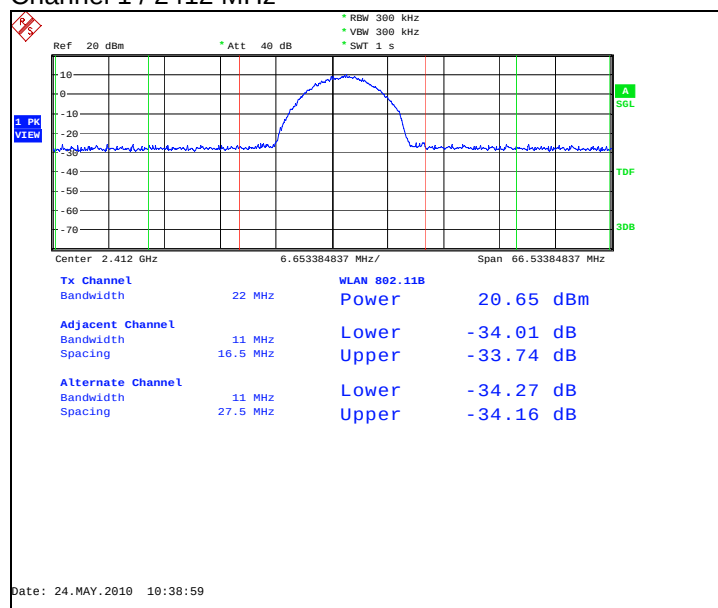
Frequency range [MHz]	Limit [W]	Limit [dBm]
2400 – 2483.5	≤ 1	≤ 30

3.2. WLAN Test results

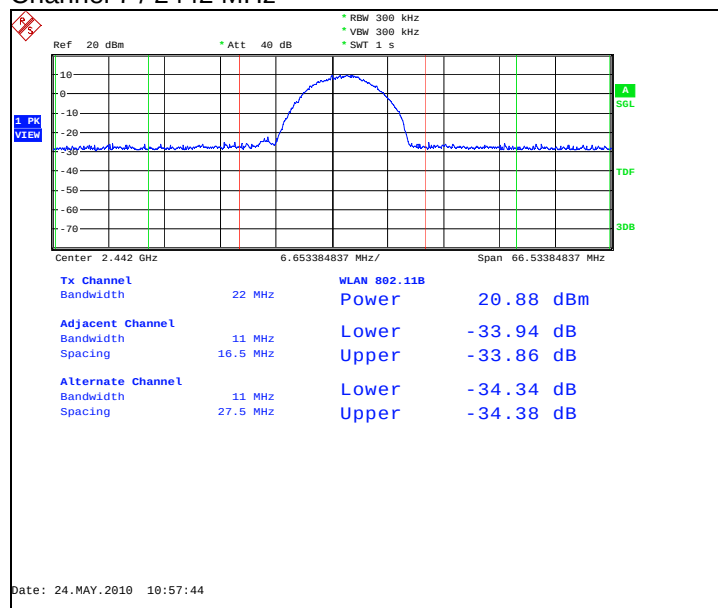
3.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [W]	Result
1 / 2412	20.65	0.116	PASSED
7 / 2442	20.88	0.122	PASSED
11 / 2462	20.89	0.123	PASSED

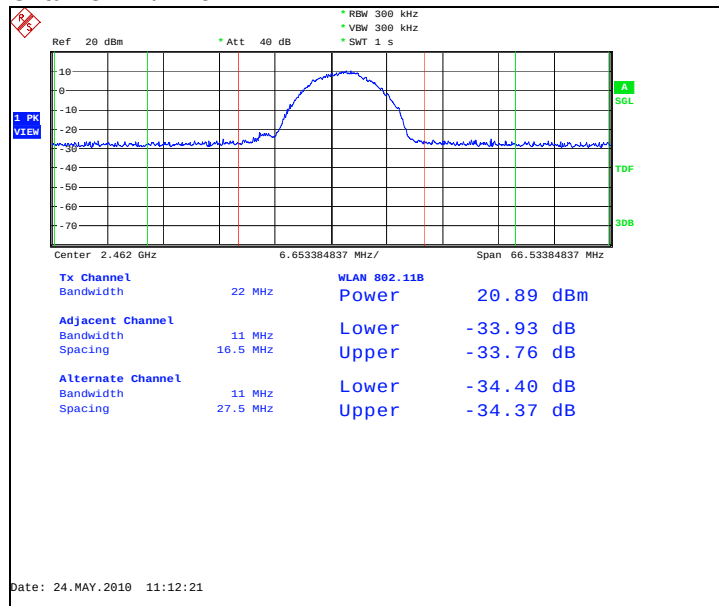
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



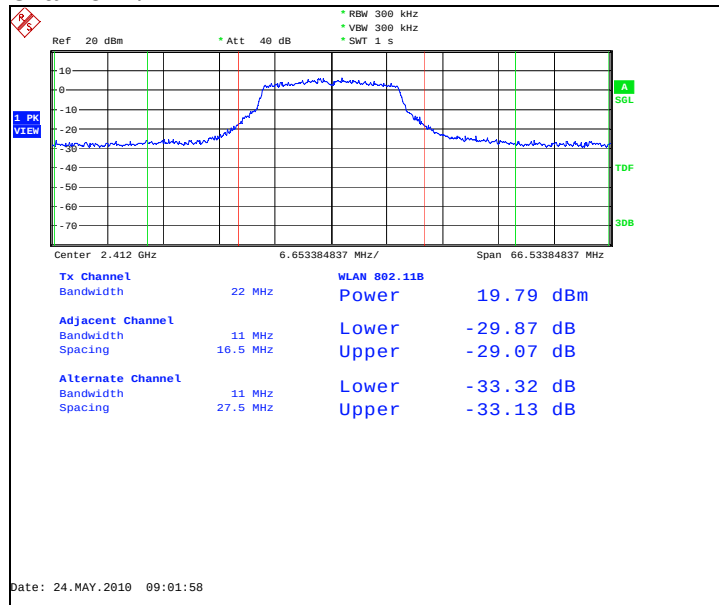
Channel 11 / 2462 MHz



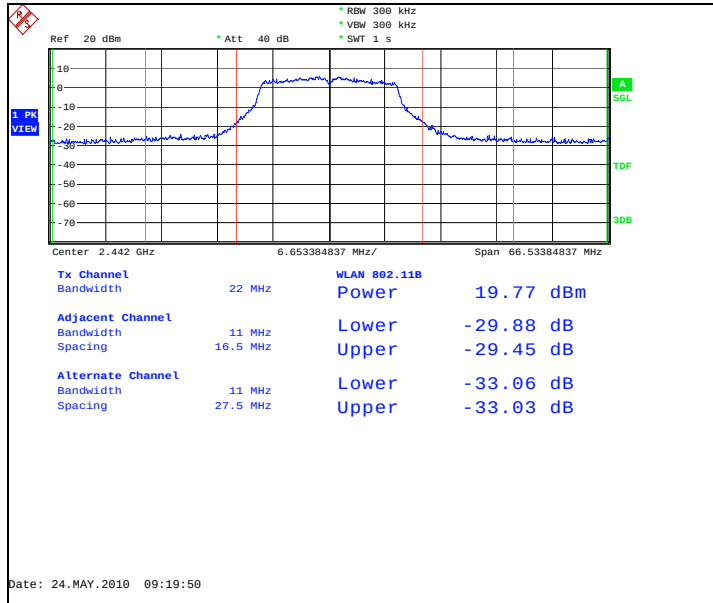
3.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [W]	Result
1 / 2412	19.79	0.095	PASSED
7 / 2442	19.77	0.095	PASSED
11 / 2462	20.25	0.106	PASSED

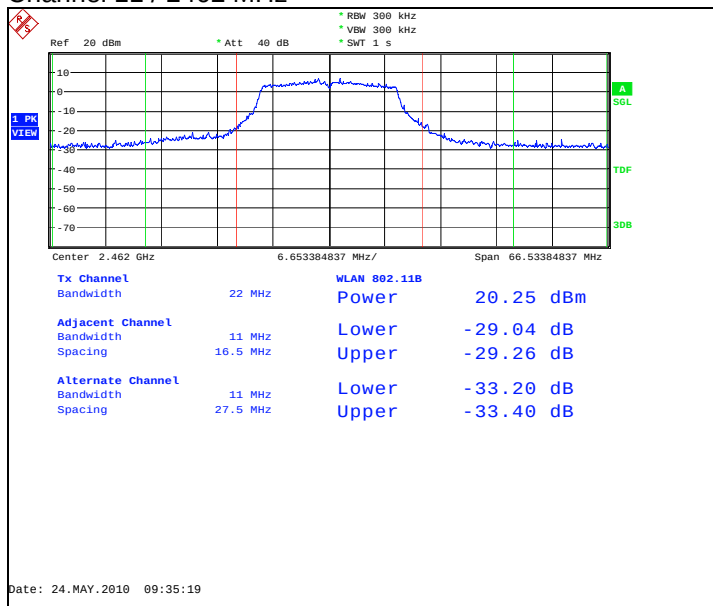
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



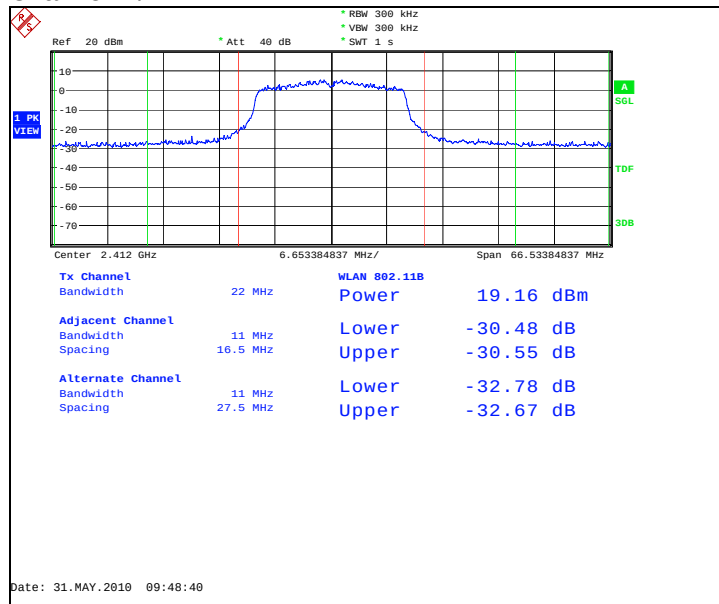
Channel 11 / 2462 MHz



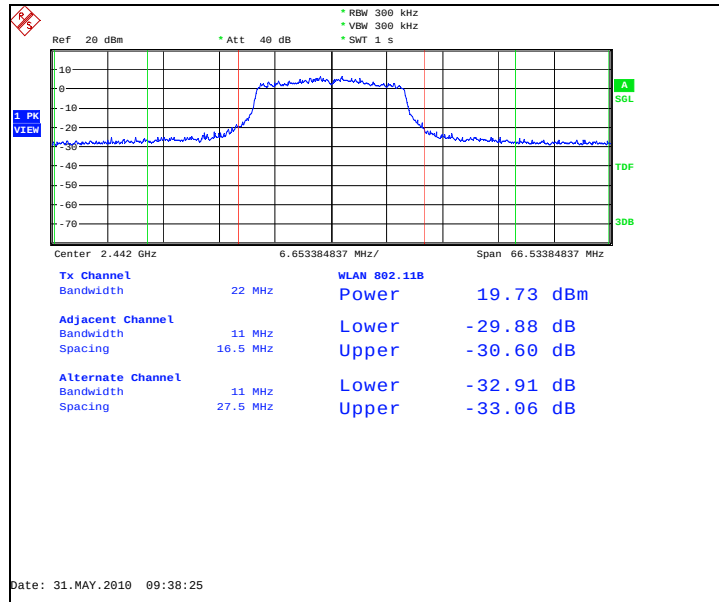
3.2.3 802.11n HT20 MCS 0

Channel / f_c [MHz]	P [dBm]	P [W]	Result
1 / 2412	19.16	0.082	PASSED
7 / 2442	19.73	0.094	PASSED
11 / 2462	20.10	0.102	PASSED

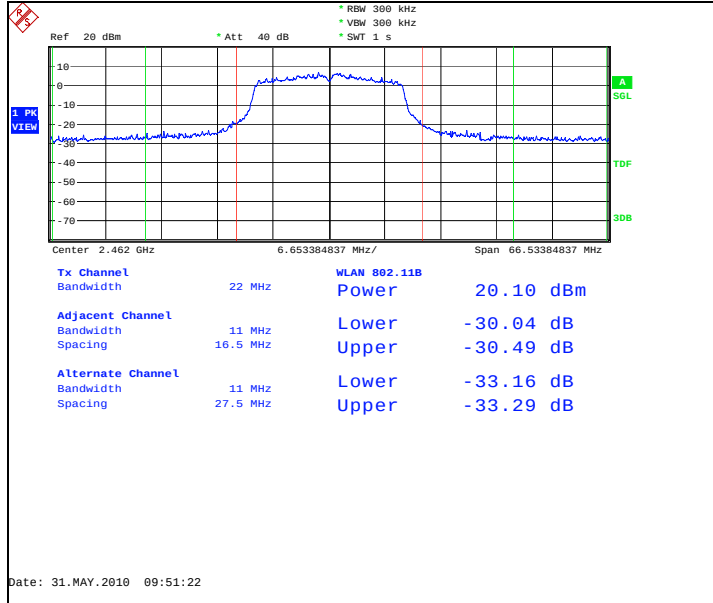
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



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

EUT with DUT number	RM-639 DUT 42246
Accessories with DUT numbers	BL-4S DUT 42250, AC-8E DUT 42252, WH-102 DUT 42254
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 43 / 100.2
Date of measurements	20-May-2010
Measured by	Jari Jantunen

4.1. Test method and limit

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

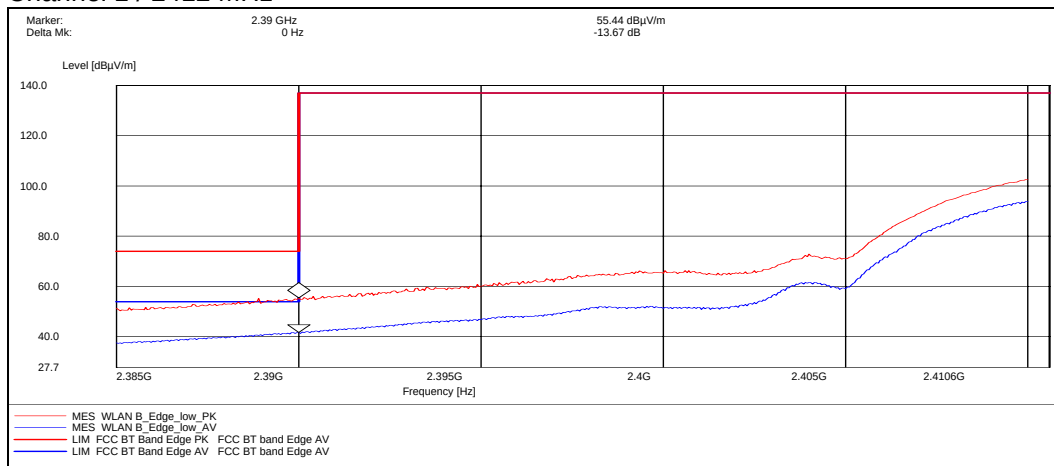
Limits for band edge compliance of RF emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit Average [dBμV/m]	Limit Peak [dBμV/m]
Below 2390 and above 2483.5	≤ 54	≤ 74

4.2. WLAN Test results

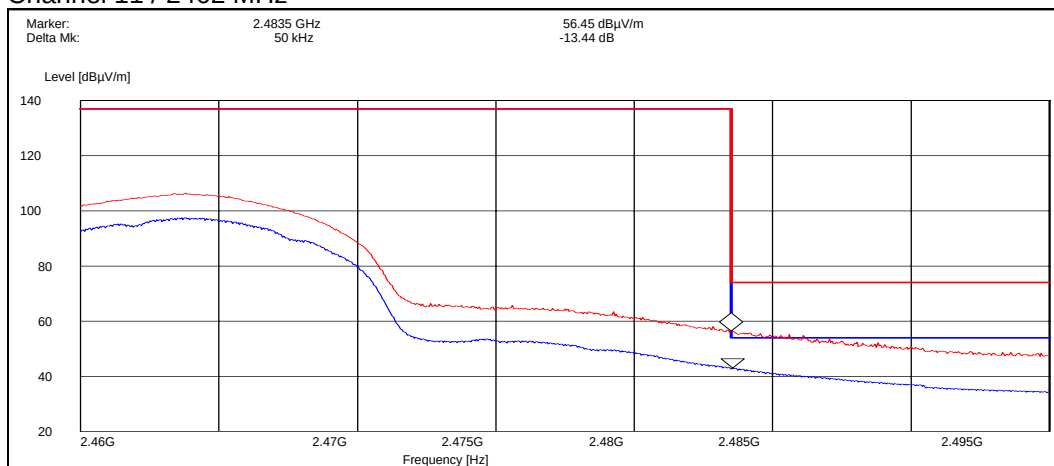
4.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 1 / 2412 MHz



Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	55.40	PASSED
Average	41.80	PASSED

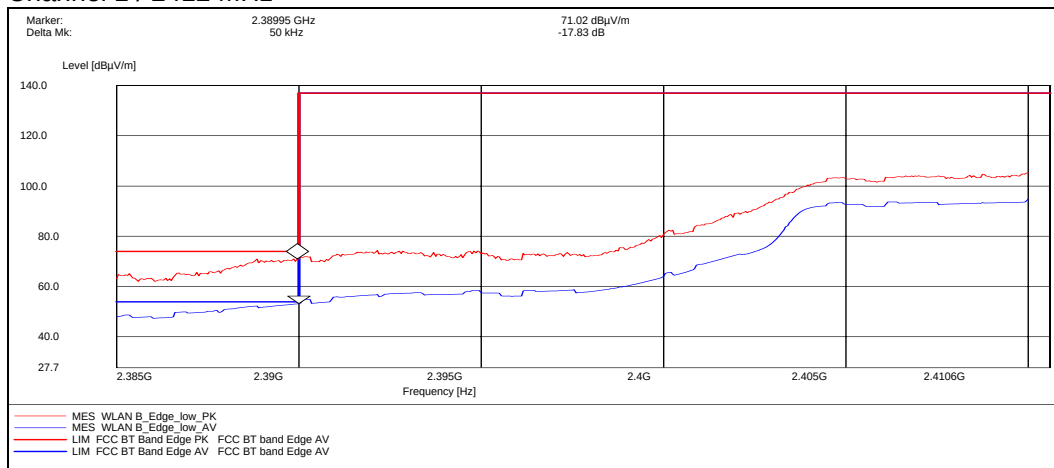
Channel 11 / 2462 MHz



Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	56.50	PASSED
Average	43.00	PASSED

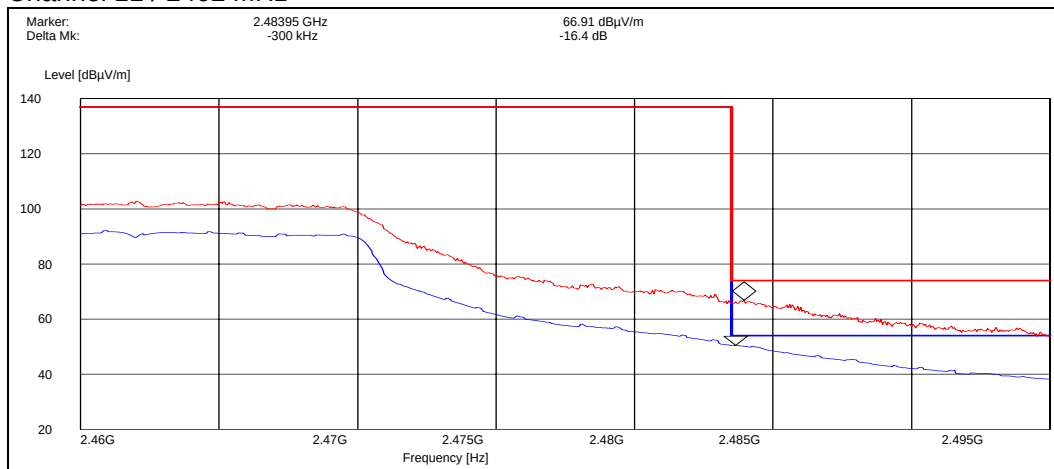
4.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 1 / 2412 MHz



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	71.00	PASSED
Average	53.20	PASSED

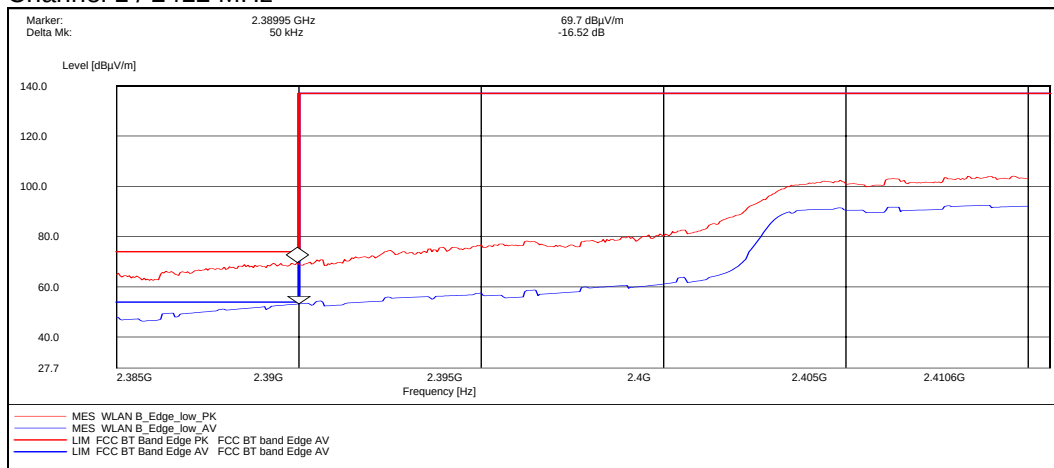
Channel 11 / 2462 MHz



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	66.90	PASSED
Average	50.50	PASSED

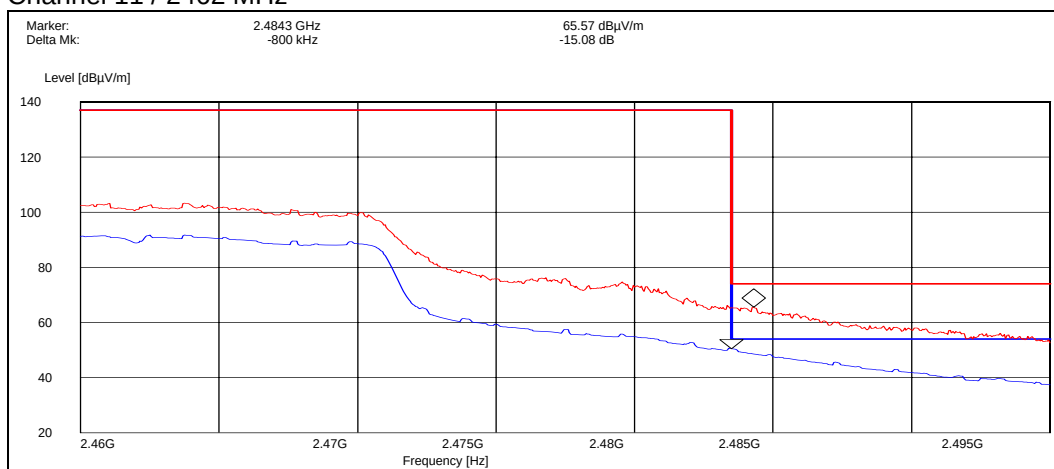
4.2.3 802.11n HT20 MCS 0

Channel 1 / 2412 MHz



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	69.70	PASSED
Average	53.20	PASSED

Channel 11 / 2462 MHz



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	65.60	PASSED
Average	50.50	PASSED

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

EUT with DUT number	RM-639 DUT42247
Accessories with DUT numbers	BL-4S DUT42251
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 46 / 99.2
Date of measurements	24-May-2010
Measured by	Jari Jantunen

5.1. Test method and limit

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

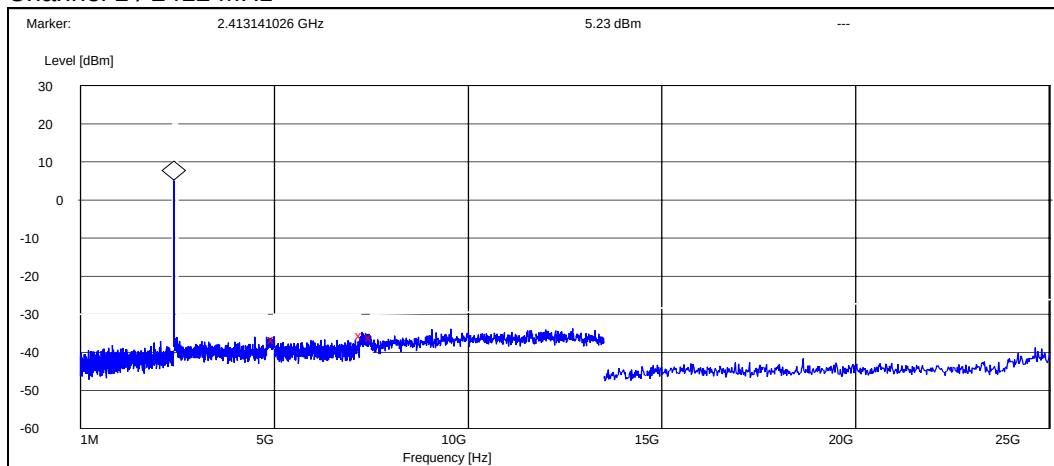
Limits for spurious RF conducted emissions measurements

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

5.2. WLAN Test results

5.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

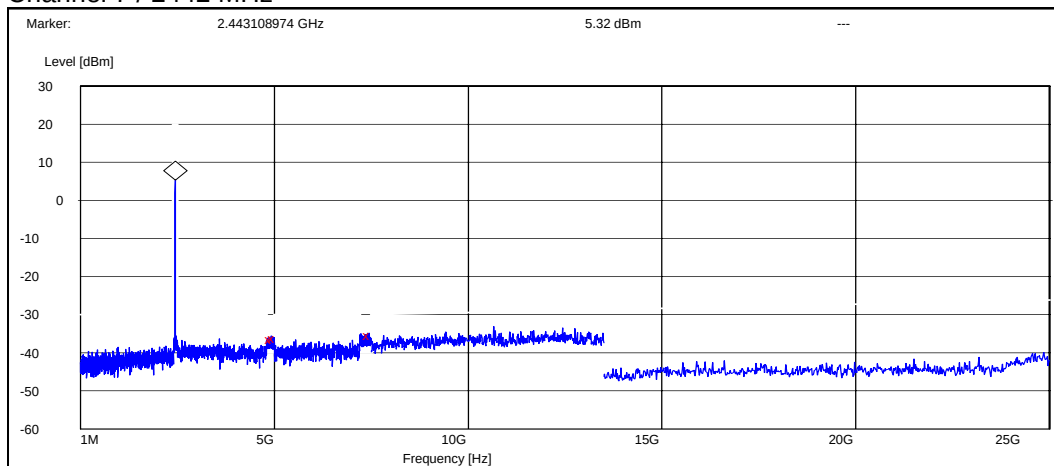
Channel 1 / 2412 MHz



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

Frequency [MHz]	P [dBc]	Result
4996.153846	-41.731782	PASSED
7256.250000	-40.831782	PASSED
7500.000000	-41.131782	PASSED

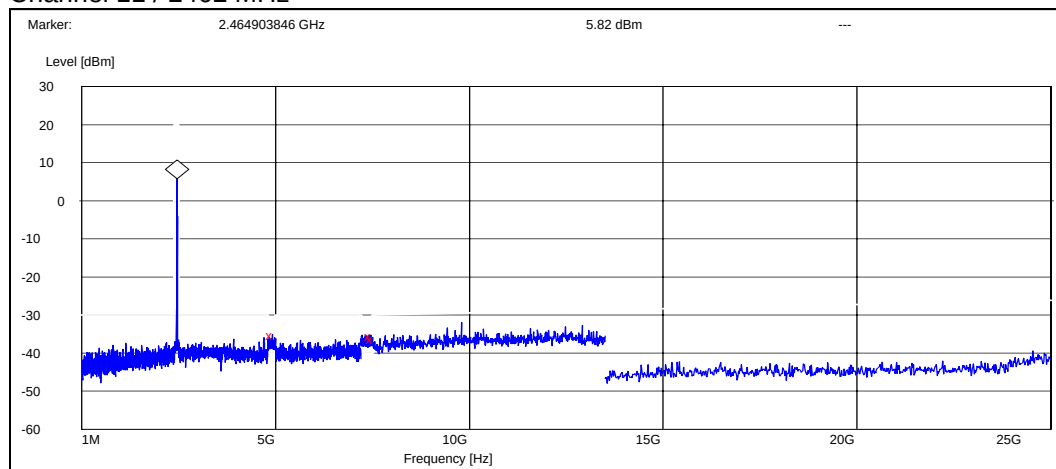
Channel 7 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4920.192308	-41.717134	PASSED
5000.000000	-41.517134	PASSED
7449.519231	-40.717134	PASSED

Channel 11 / 2462 MHz

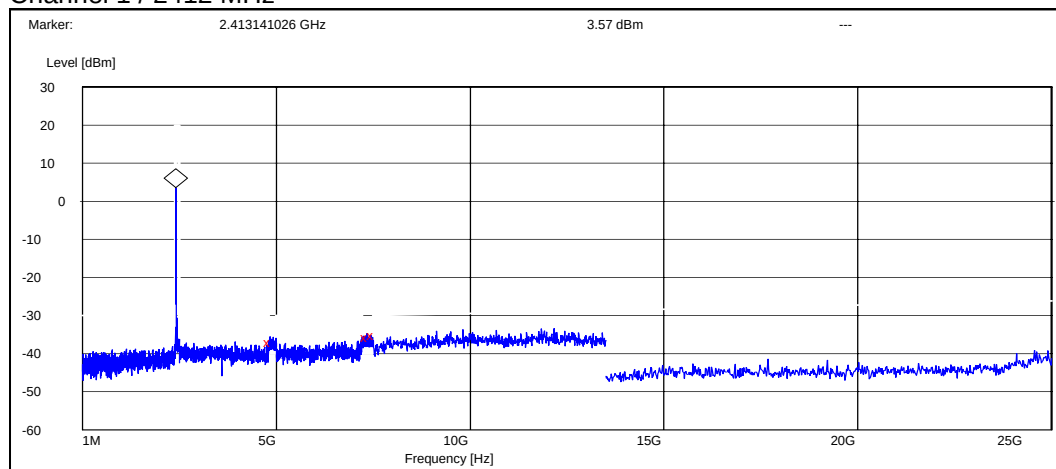


Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4914.743590	-41.220518	PASSED
7469.711538	-41.520518	PASSED
7500.000000	-42.120518	PASSED

5.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

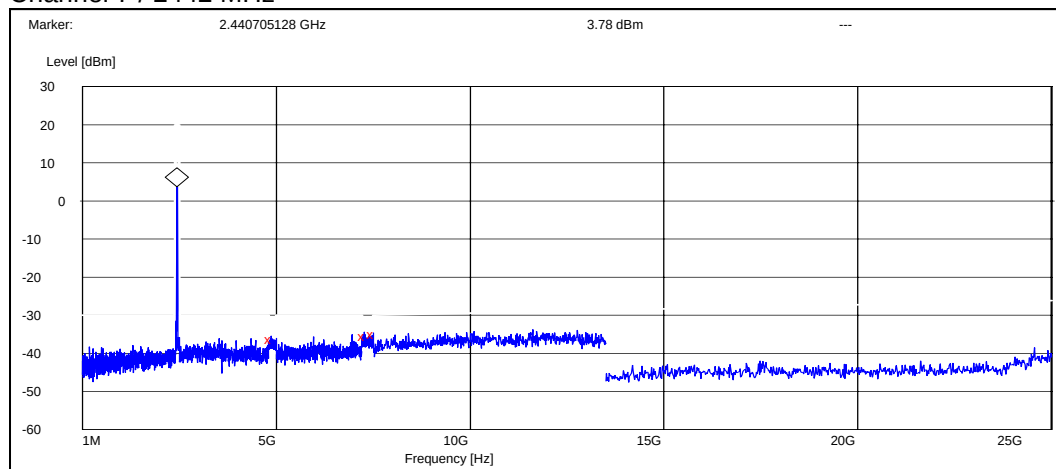
Channel 1 / 2412 MHz



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

Frequency [MHz]	P [dBc]	Result
4833.653846	-40.471793	PASSED
7341.826923	-39.271793	PASSED
7500.000000	-38.771793	PASSED

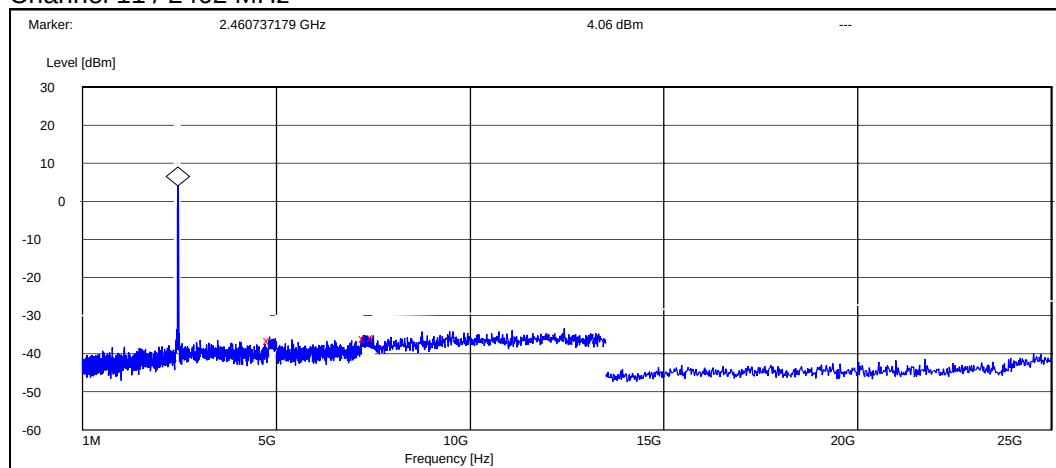
Channel 7 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4868.910256	-40.076843	PASSED
7278.365385	-39.176843	PASSED
7500.000000	-38.676843	PASSED

Channel 11 / 2462 MHz

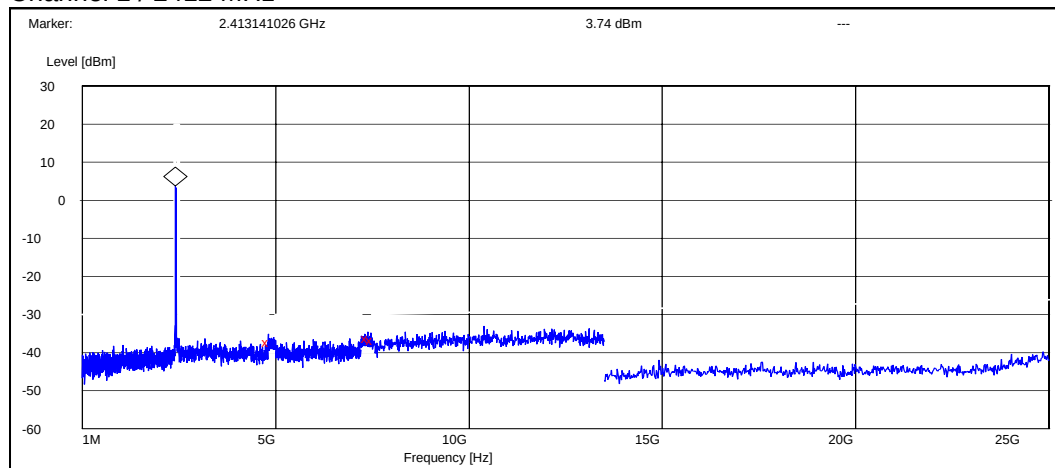


Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4824.679487	-40.464175	PASSED
7281.730769	-39.964175	PASSED
7500.000000	-39.764175	PASSED

5.2.3 802.11n HT20 MCS 0

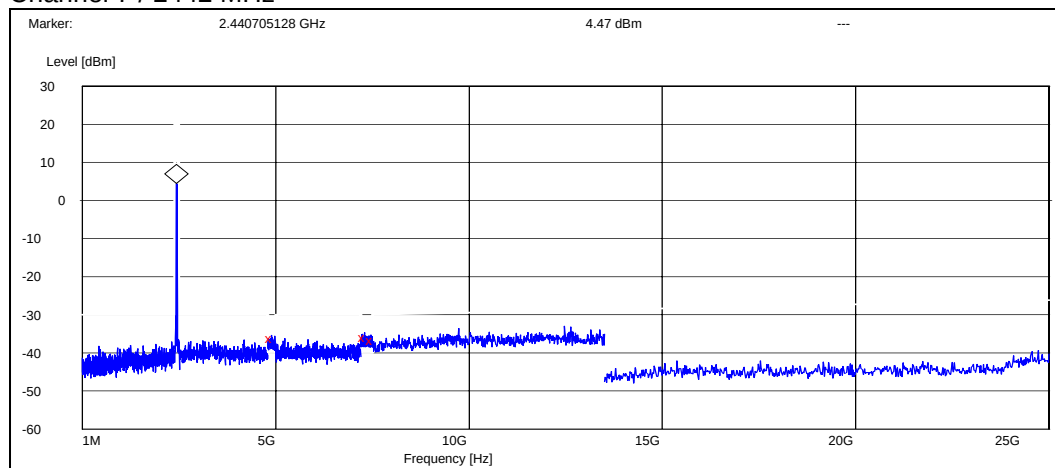
Channel 1 / 2412 MHz



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

Frequency [MHz]	P [dBc]	Result
4813.141026	-40.940990	PASSED
7375.000000	-40.040990	PASSED
7500.000000	-40.440990	PASSED

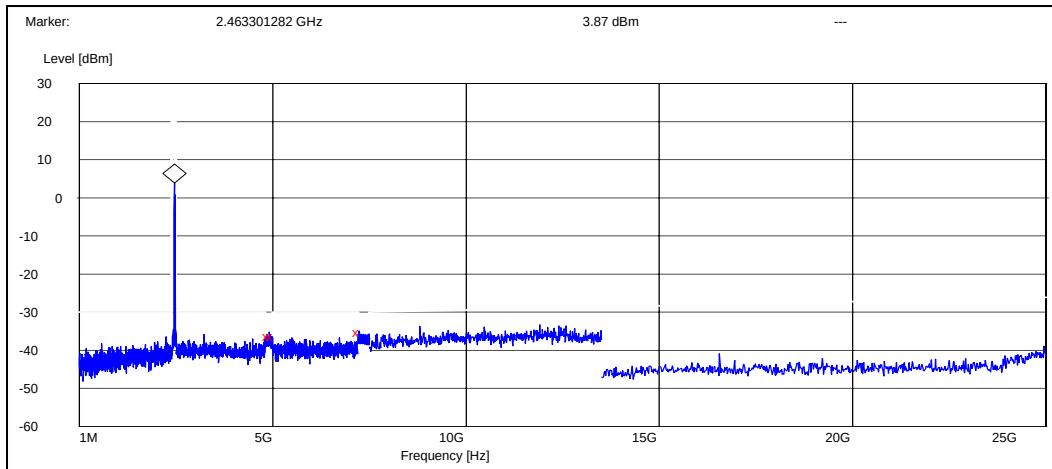
Channel 7 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4891.987179	-40.566327	PASSED
7296.153846	-40.466327	PASSED
7500.000000	-41.266327	PASSED

Channel 11 / 2462 MHz



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

Frequency [MHz]	P [dBc]	Result
4904.807692	-40.268195	PASSED
5000.000000	-40.268195	PASSED
7230.288462	-39.268195	PASSED

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

EUT with DUT number	RM-639 DUT 42246
Accessories with DUT numbers	BL-4S DUT 42250, AC-8E DUT 42252, WH-102 DUT 42254
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 43 / 100.2
Date of measurements	20-May-2010
Measured by	Jari Jantunen

6.1. 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 results are obtained as described below:

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

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

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

6.2. WLAN Test results

6.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

TX mode, channel 1 / 2412 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	41.80	123.03	42.90	-1.1	VERTICAL	PASSED
7236.000000	47.70	242.66	45.10	2.6	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	31.60	38.02	32.70	-1.1	VERTICAL	PASSED
7236.000000	30.20	32.36	27.60	2.6	VERTICAL	PASSED

TX mode, channel 7 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
31.902405	16.10	6.38	26.20	-10.1	HORIZONTAL	PASSED
37.535872	11.70	3.85	25.50	-13.8	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4887.269539	43.50	149.62	44.70	-1.2	HORIZONTAL	PASSED
4889.271543	43.90	156.68	45.10	-1.2	HORIZONTAL	PASSED
7313.631263	43.40	147.91	40.40	3.0	VERTICAL	PASSED
7334.161323	51.30	367.28	48.40	2.9	HORIZONTAL	PASSED
17479.457916	53.30	462.38	34.60	18.7	HORIZONTAL	PASSED
17732.460922	55.00	562.34	34.30	20.7	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4886.769539	31.00	35.48	32.20	-1.2	HORIZONTAL	PASSED
4889.771543	29.10	28.51	30.30	-1.2	HORIZONTAL	PASSED
7318.631263	30.40	33.11	27.30	3.1	VERTICAL	PASSED
7333.661323	30.20	32.36	27.30	2.9	HORIZONTAL	PASSED
17478.457916	39.60	95.50	20.90	18.7	HORIZONTAL	PASSED
17733.460922	42.10	127.35	21.40	20.7	VERTICAL	PASSED

TX mode, channel 11 / 2462 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	41.10	113.50	42.20	-1.1	VERTICAL	PASSED
7386.000000	48.40	263.03	45.20	3.2	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	34.00	50.12	35.10	-1.1	HORIZONTAL	PASSED
7386.000000	29.90	31.26	26.70	3.2	HORIZONTAL	PASSED

6.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

TX mode, channel 1 / 2412 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	42.60	134.90	43.70	-1.1	VERTICAL	PASSED
7236.000000	46.80	218.78	44.20	2.6	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	29.30	29.17	30.40	-1.1	VERTICAL	PASSED
7236.000000	30.20	32.36	27.60	2.6	VERTICAL	PASSED

TX mode, channel 7 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
37.676353	21.70	12.16	35.60	-13.9	VERTICAL	PASSED
74.569940	5.50	1.88	29.00	-23.5	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4885.271543	43.60	151.36	44.80	-1.2	HORIZONTAL	PASSED
4885.779559	42.20	128.82	43.40	-1.2	VERTICAL	PASSED
7319.631263	42.90	139.64	39.90	3.0	VERTICAL	PASSED
7333.161323	47.20	229.09	44.30	2.9	HORIZONTAL	PASSED
17490.987976	52.20	407.38	33.40	18.8	VERTICAL	PASSED
17946.891784	54.90	555.90	34.10	20.8	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4887.771543	29.80	30.90	31.00	-1.2	HORIZONTAL	PASSED
4891.779559	28.00	25.12	29.20	-1.2	VERTICAL	PASSED
7314.131263	30.40	33.11	27.40	3.0	VERTICAL	PASSED
7330.161323	30.00	31.62	27.10	2.9	HORIZONTAL	PASSED
17492.987976	39.70	96.61	20.80	18.9	VERTICAL	PASSED
17947.391784	42.00	125.89	21.20	20.8	VERTICAL	PASSED

TX mode, channel 11 / 2462 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	42.40	131.83	43.50	-1.1	VERTICAL	PASSED
7386.000000	48.50	266.07	45.30	3.2	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	28.70	27.23	29.80	-1.1	VERTICAL	PASSED
7386.000000	30.10	31.99	26.90	3.2	VERTICAL	PASSED

6.2.3 802.11n HT20 MCS 0

TX mode, channel 1 / 2412 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	41.50	118.85	42.60	-1.1	HORIZONTAL	PASSED
7236.000000	49.00	281.84	46.40	2.6	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	28.70	27.23	29.80	-1.1	HORIZONTAL	PASSED
7236.000000	30.20	32.36	27.60	2.6	VERTICAL	PASSED

TX mode, channel 7 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
38.076353	22.40	13.18	36.50	-14.1	VERTICAL	PASSED
64.488778	17.90	7.85	43.40	-25.5	HORIZONTAL	PASSED
73.608016	17.60	7.59	41.30	-23.7	VERTICAL	PASSED
74.169940	16.90	7.00	40.50	-23.6	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2359.810621	55.70	609.54	54.80	0.9	HORIZONTAL	PASSED
4885.275551	42.80	138.04	44.00	-1.2	HORIZONTAL	PASSED
4888.277555	43.20	144.54	44.40	-1.2	HORIZONTAL	PASSED
7327.153307	46.70	216.27	43.80	2.9	HORIZONTAL	PASSED
17494.487976	52.60	426.58	33.70	18.9	VERTICAL	PASSED
17710.420842	54.70	543.25	34.20	20.5	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2363.810621	43.50	149.62	42.10	1.4	HORIZONTAL	PASSED
4886.775551	29.50	29.85	30.70	-1.2	HORIZONTAL	PASSED
4890.277555	29.40	29.51	30.60	-1.2	HORIZONTAL	PASSED
7328.153307	30.30	32.73	27.40	2.9	HORIZONTAL	PASSED
17491.987976	39.70	96.61	20.90	18.8	VERTICAL	PASSED
17708.920842	41.90	124.45	21.40	20.5	HORIZONTAL	PASSED

TX mode, channel 11 / 2462 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	44.70	171.79	45.80	-1.1	HORIZONTAL	PASSED
7386.000000	50.50	334.97	47.30	3.2	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	27.10	22.65	28.20	-1.1	VERTICAL	PASSED
7386.000000	30.20	32.36	27.00	3.2	VERTICAL	PASSED

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

EUT with DUT number	RM-639 DUT 42246
Accessories with DUT numbers	BL-4S DUT 42250, AC-8E DUT 42252, WH-102 DUT 42254
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	19 / 50 / 99.1
Date of measurements	03-Jun-2010
Measured by	Jari Jantunen

7.1. Test method and limit

The measurement is made according to DTS procedures 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.

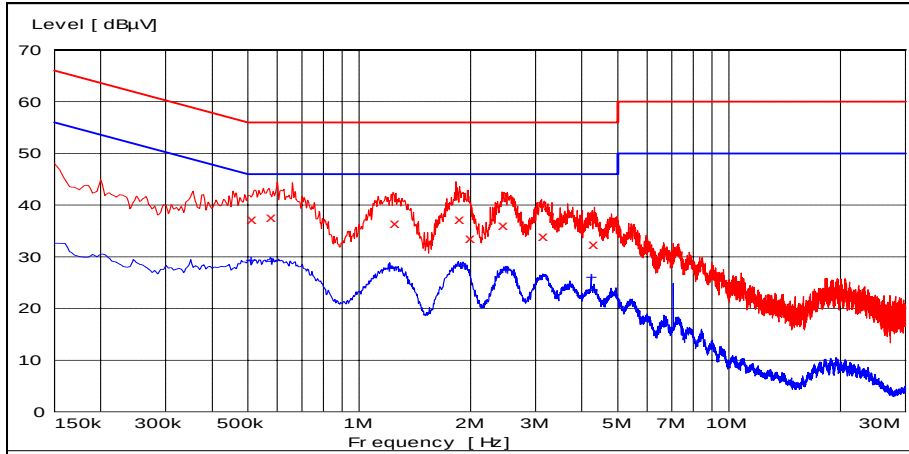
CISPR 22 Class B limits

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

7.2. WLAN Test results

7.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 7 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.515000	37.40	L1	PASSED
0.580000	37.60	L1	PASSED
1.250000	36.50	L1	PASSED
1.875000	37.40	L1	PASSED
2.000000	33.60	L1	PASSED
2.455000	36.10	L1	PASSED
3.160000	34.10	L1	PASSED
4.320000	32.50	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.510000	29.40	L1	PASSED
0.580000	29.30	L1	PASSED
1.205000	27.90	L1	PASSED
1.900000	28.40	L1	PASSED
2.495000	27.60	L1	PASSED
2.515000	27.50	L1	PASSED
4.240000	26.00	L1	PASSED

8. 6 dB bandwidth (FCC §15.247(a)(2), RSS-210 A8.2 (a))

EUT with DUT number	RM-639 DUT42247
Accessories with DUT numbers	BL-4S DUT42251
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 46 / 99.2
Date of measurements	24-May-2010
Measured by	Jari Jantunen

8.1. 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

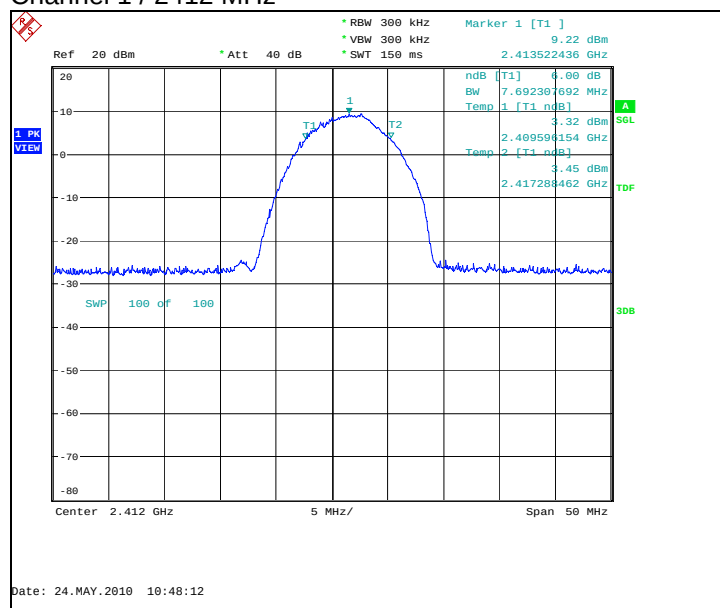
Limit [kHz]
≥ 500

8.2. WLAN test results

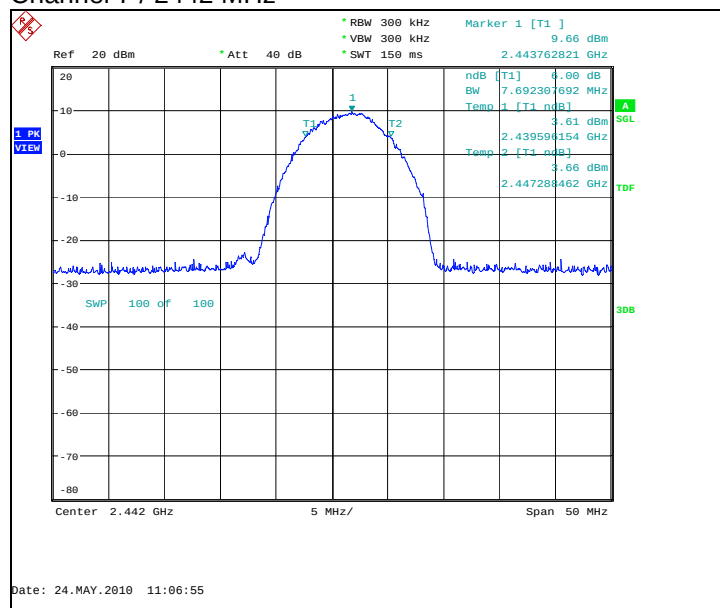
8.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_c [MHz]	6 dB bandwidth [kHz]	Result
1	7692.308	PASSED
7	7692.308	PASSED
11	7532.051	PASSED

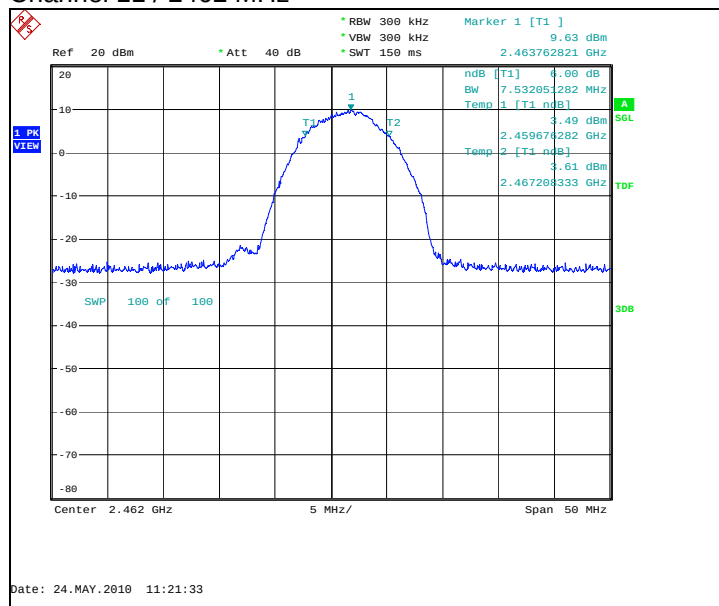
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



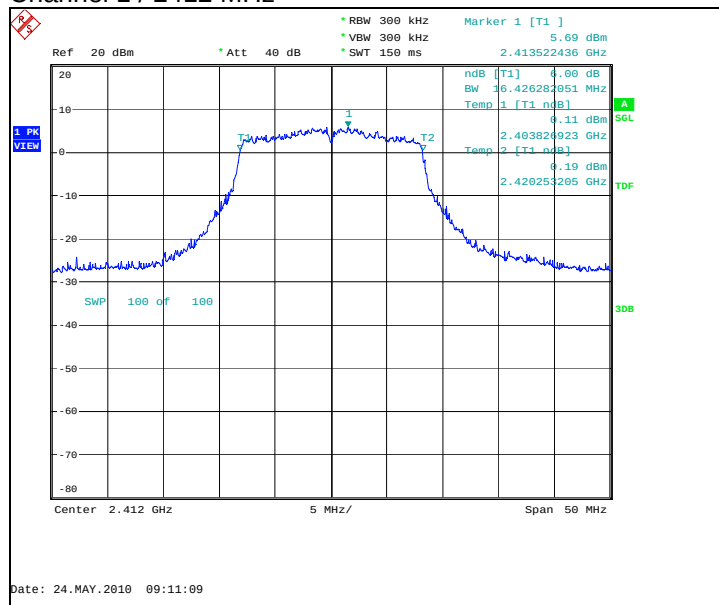
Channel 11 / 2462 MHz



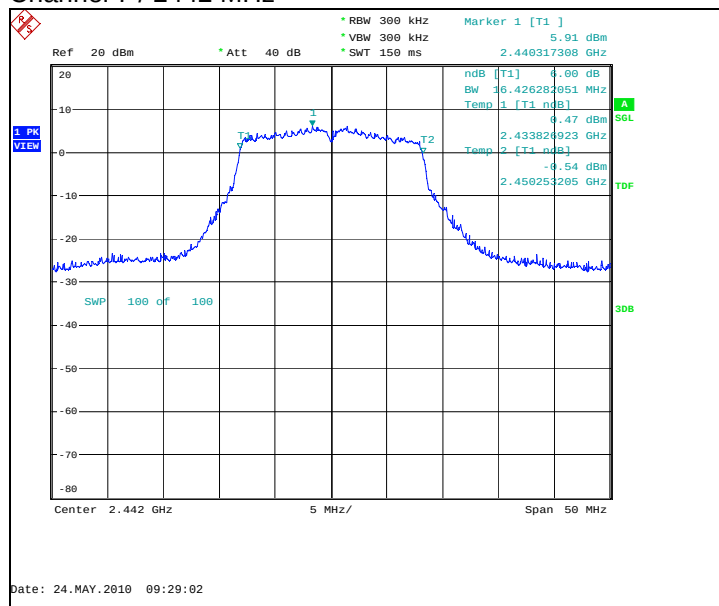
8.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
1	16426.282	PASSED
7	16426.282	PASSED
11	16346.154	PASSED

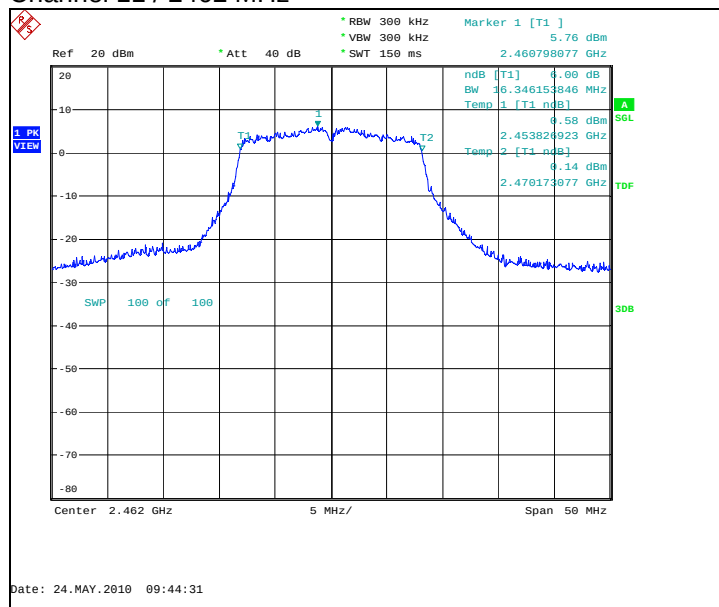
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



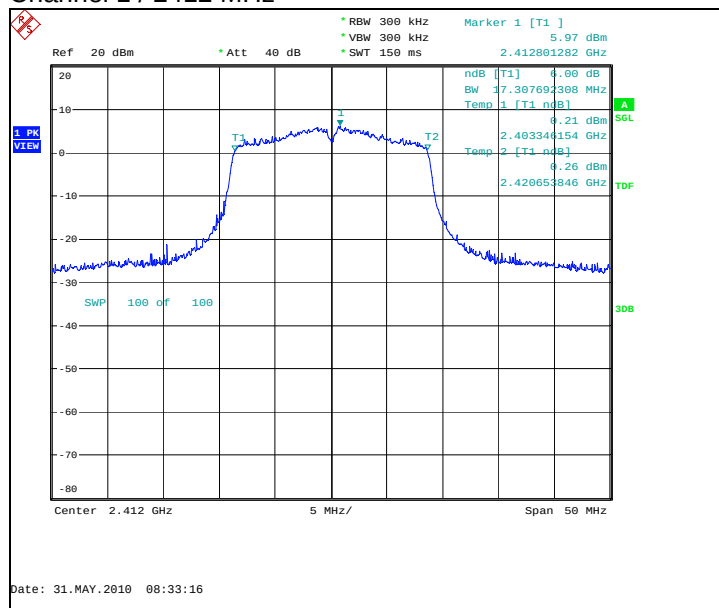
Channel 11 / 2462 MHz



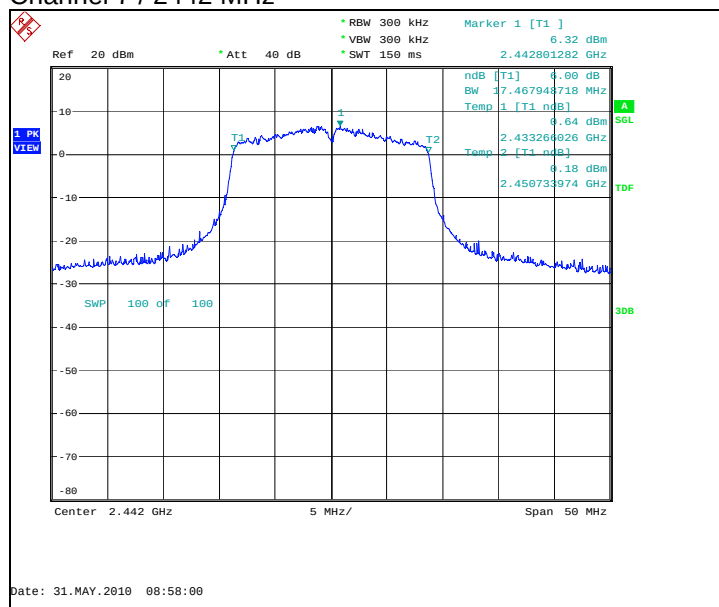
8.2.3 802.11n HT20 MCS 0

Channel / f_c [MHz]	6 dB bandwidth [kHz]	Result
1	17307.692	PASSED
7	17467.949	PASSED
11	17387.821	PASSED

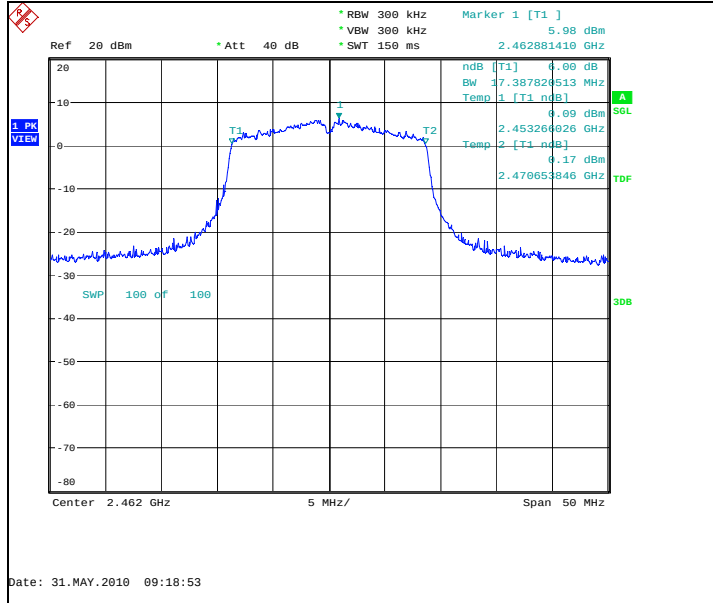
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



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

EUT with DUT number	RM-639 DUT42247
Accessories with DUT numbers	BL-4S DUT42251
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 46 / 99.2
Date of measurements	24-May-2010
Measured by	Jari Jantunen

9.1. 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

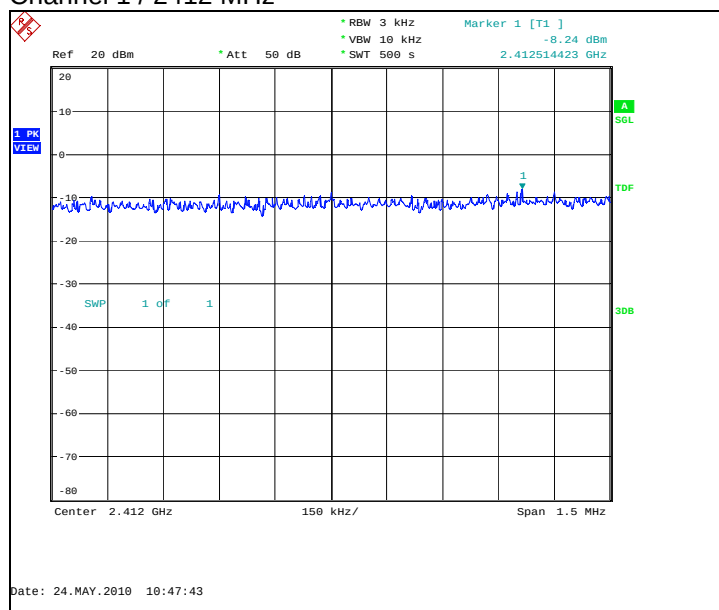
Limit [dBm] @ 3 kHz
≤ 8

9.2. WLAN test results

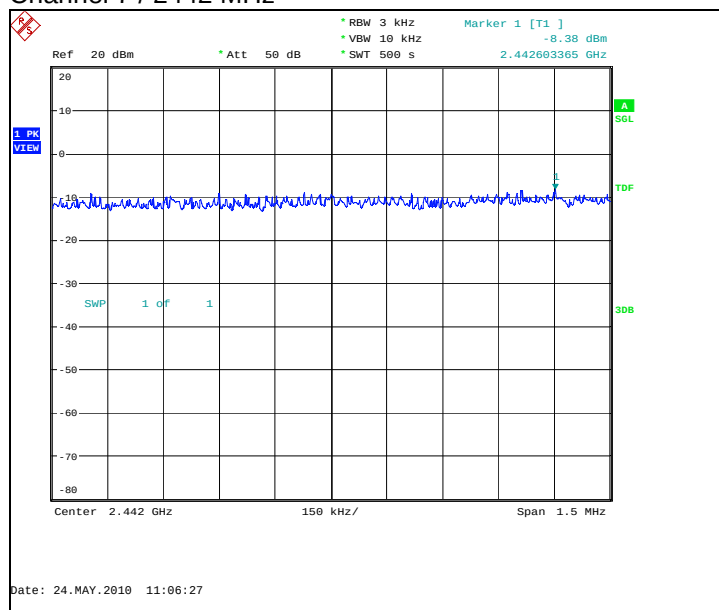
9.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-8.24	PASSED
7 / 2442	-8.38	PASSED
11 / 2462	-8.68	PASSED

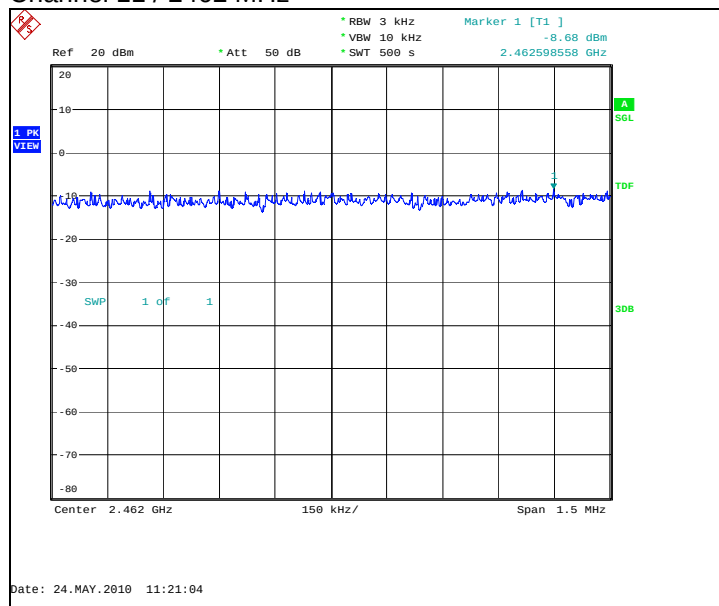
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



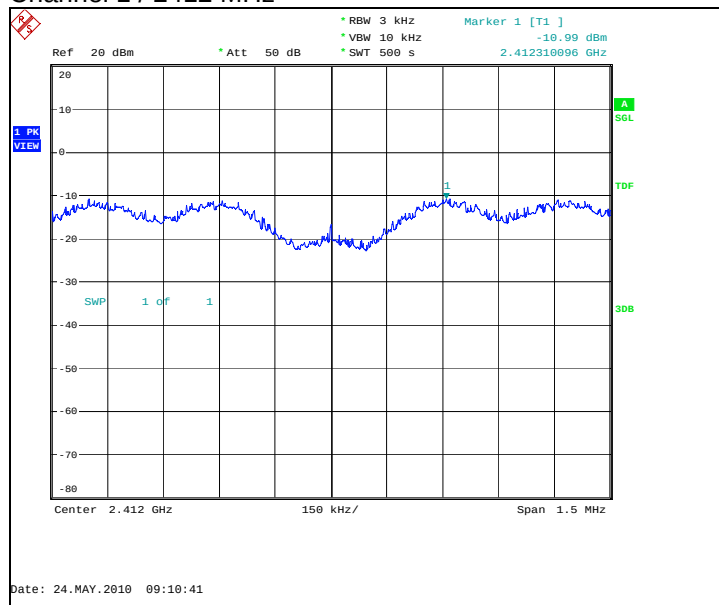
Channel 11 / 2462 MHz



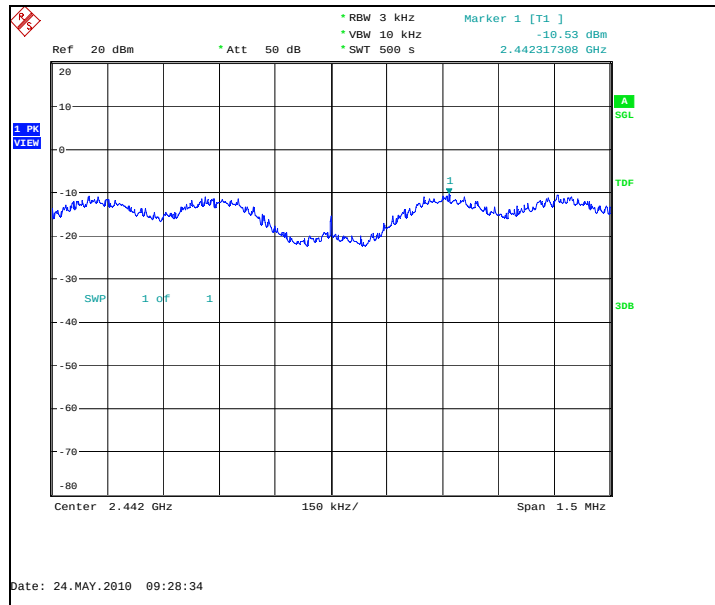
9.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-10.99	PASSED
7 / 2442	-10.53	PASSED
11 / 2462	-10.33	PASSED

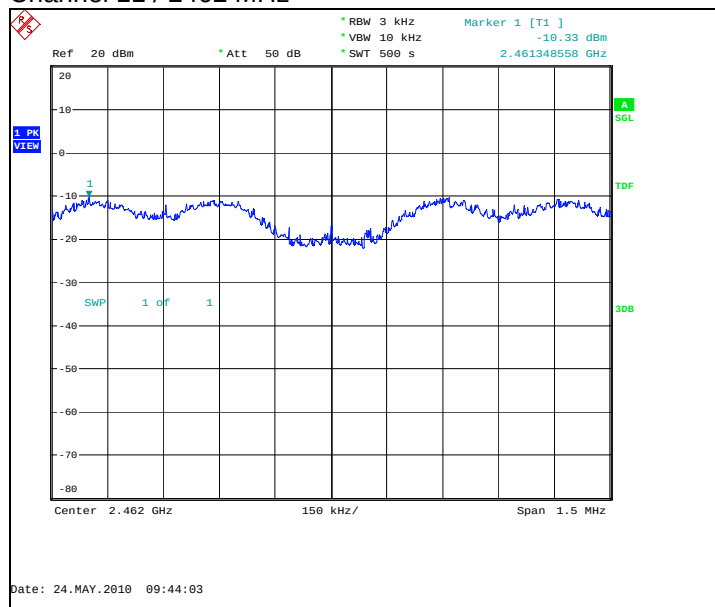
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



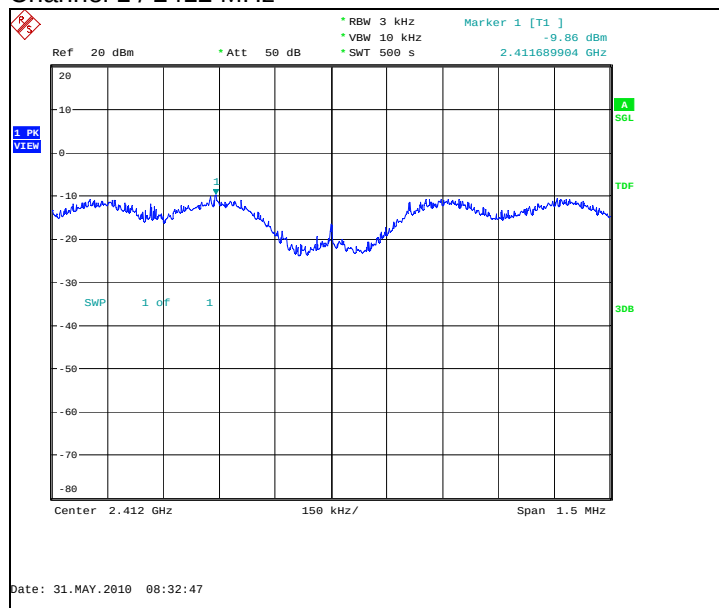
Channel 11 / 2462 MHz



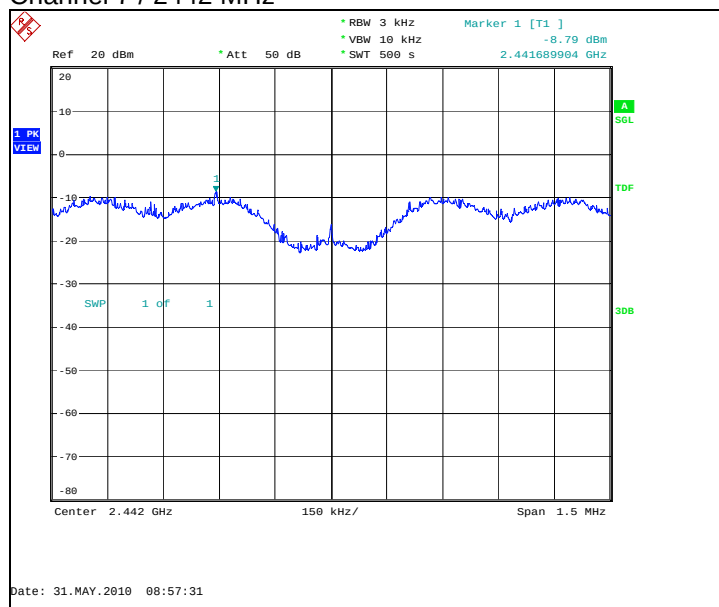
9.2.3 802.11n HT20 MCS 0

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-9.86	PASSED
7 / 2442	-8.79	PASSED
11 / 2462	-9.58	PASSED

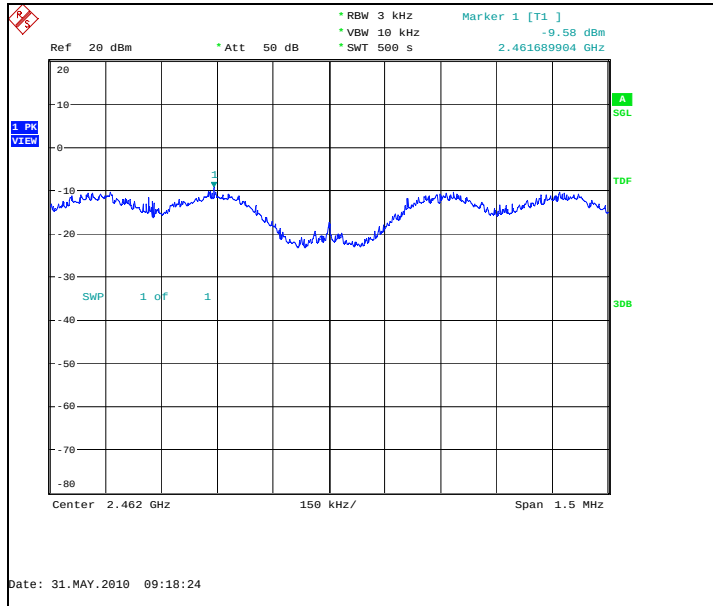
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



10. Test Equipment

10.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM38112	Power supply	6632A	Agilent	22/24/27, 15C
TM38631	Signal Generator	83640L	Agilent	22/24/27, 15C, 15B
OM0631 2	Signal Generator	E4422B	Agilent	22/24
TM37678	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
TM37773	Communication Tester	CMU200	R&S	22/24/27, 15C, 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
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
2058	Receiver	ESPC	R&S	15C, 15B
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B
2002	Communication Tester	CMU200	R&S	22/24/27
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

10.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM38114	Power supply	6632A	Agilent	22/24/27, 15C, 15B
TM38631	Signal Generator	83640L	Agilent	22/24/27, 15C, 15B
TM38323	Preamplifier	PA-02 18-26 GHz	EMC Automation	22/24/27, 15C, 15B
-	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C
TM26497	Antenna	3115	Emco	22/24/27, 15C, 15B
TM37678	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
TM37773	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
TM38845	Receiver	ESIB 26	R&S	22/24/27, 15C, 15B
-	Antenna	HL562	R&S	22/24/27, 15C, 15B
TM26500	Turntable	DS412	Deisel	22/24/27, 15C, 15B
TM30642	Mast/turntable controller	HD-100	Deisel	22/24/27, 15C, 15B
TM38990	Remote switching module	RSM1	EMC Automation	22/24/27, 15C, 15B
TM38341	System interface	SI-300	EMC Automation	22/24/27, 15C, 15B
-	Mini mast	2075-2	ETS Lindgren	22/24/27, 15C, 15B
TM38843	Mini mast	2075	Emco	22/24/27, 15C, 15B
TM38842	Controller	2090	Emco	22/24/27, 15C, 15B
TM39158	Antenna	3116	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

Eq. No	Equipment	Type	Manufacturer	Used in
-	Air pressure and temperature logger	635-2	Testo	22/24/27, 15C, 15B
-	Air pressure sensor	0638-1835	Testo	22/24/27, 15C, 15B
TM39180	Laser distance meter	Disto Pro	Leica	22/24/27, 15C, 15B
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	Miteq	22/24/27, 15C, 15B
-	Preamplifier	AFS4-00100300-20-23P6	Miteq	15C
TM37498	Preamplifier	AMF-5D-020180-26-10P	Miteq	22/24/27, 15C, 15B
TM30599	Semi anechoic chambre	UNKNOWN	TDK	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	Torqueleader	22/24/27, 15C, 15B
TM38066	High pass filter	4HC3000/18000-3-KK	Trilithic	22/24/27, 15C, 15B
TM26511	Tunable notch filter	WRCA870/	Wainwright	27
TM38215	Band reject filter	WRCD 1920/1980-1918/1982-40/20	Wainwright UMTS	27
TM38214	Band reject filter	WRCT 2402/2480-2400/2483.5-30/	Wainwright ISM	15C
-	Band reject filter	WRCG1877/1883-1870/1890-40/6EE	Wainwright	27
-	Band reject filter	WRCG1729.4/1735.4-1722.4/1742.4-40/6SS	Wainwright	27
-	Band reject filter	WRCG832/838-825/848-40/5SS	Wainwright	27
TM23892	Controller	G-1000SDX	Yaesu	22/24/27
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B
-	Antenna	SBA 9113	Schwarzbeck	22/24/27
6023	Antenna	VUBA 9117	Schwarzbeck	22/24/27, 15C