

FCC Part 15C Compliance Test Report

Test Report no.:	Salo_FCC_0737_05.doc	Date of Report:	25.09.2007
Number of pages:	59	Customer's Contact person:	Robert Binder
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FCC listing no.:	533467		
IC recognition no.:	5385		
Tested devices/ accessories:	Phone RM-313 / Battery BP-6MT, Headset HS-43 and AC-Charger AC-5E		
FCC ID:	QVVRM-313	IC:	661AE-RM313
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 and RSS-210. 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:			

Anni Manninen, System Manager

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	10.09.2007
Testing completed	12.09.2007
The customer's contact person	-
Test Plan referred to	T:\Projects\RM-313\TestPlan_RS\RS_test_plan_RM-313.xls
Notes	-
Document name	T:\Projects\RM-313\EMC\Results\FCC\Salo_FCC_0737_05.doc

1.1. EUT and Accessory Information

The EUT is a 5-band (GSM850/900/1800/1900 and WCDMA Band I) 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-313	004401/01318149/6	3001	-	10.0.005	12187
Phone	RM-313	004401/01318018/3	3001	-	10.0.005	12188
Phone	RM-313	004401/01/318144/7	3001	-	10.0.005	12226
Phone	RM-313	004401/01/318014/2	3001	-	10.0.005	12225
Headset	HS-43	0694540716602607027	-	-	-	12190
Battery	BP-6MT	3932137191110107116;0670551	-	-	-	12189
Battery	BP-6MT	3932137214110100187;0670551	-	-	-	12230
AC-Charger	AC-5E	3943496473040602898;0675540	-	-	-	11998

1.2. Summary of Test Results

Bluetooth:

Section in CFR 47	Section in RSS-GEN or RSS-210	Name of the test	Result
15.247(b)(1)	A8.4 (2)	Conducted peak output power	PASSED
15.247(c)	A8.5	Band edge compliance of RF emissions	PASSED
15.247(c)	A8.5	Spurious RF conducted emissions	PASSED
15.247(c), 15.209	A8.5	Spurious radiated emissions	PASSED
15.207	7.2.2	AC powerline conducted emissions	PASSED
15.247(a)(1)	A8.1 (1)	20 dB bandwidth	PASSED
15.247(a)(1)	A8.1 (2)	Carrier frequency separation	PASSED
15.247(a)(1)(iii)	A8.1 (4)	Number of hopping frequencies	PASSED
15.247(a)(1)(iii)	A8.1 (4)	Time of occupancy	PASSED

WLAN:

Section in CFR 47	Section in RSS-210	Name of the test	Result
15.247(b)(1)	A8.4 (4)	Conducted peak output power	PASSED
15.247(c)	A8.5	Band edge compliance of RF emissions	PASSED
15.247(c)	A8.5	Spurious RF conducted emissions	PASSED
15.247(c), 15.209	A8.5	Spurious radiated emissions	PASSED
15.207	7.2.2	AC powerline conducted emissions	PASSED
15.247(a)(2)	A8.2 (1)	6 dB bandwidth	PASSED
15.247(e)	A8.2 (2)	Power spectral density	PASSED

PASSED

The EUT complies with the essential requirements in the standard.

FAILED
NP

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

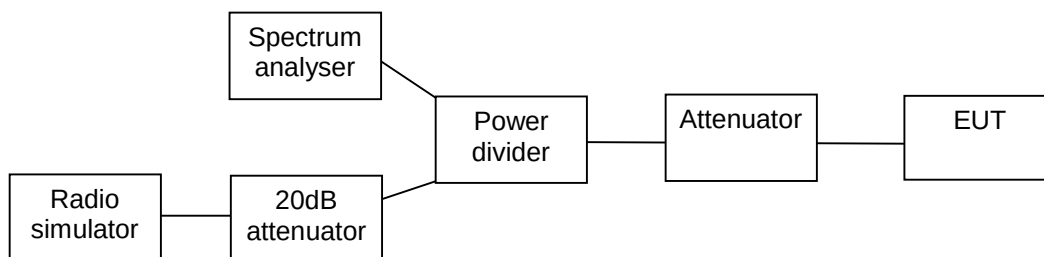
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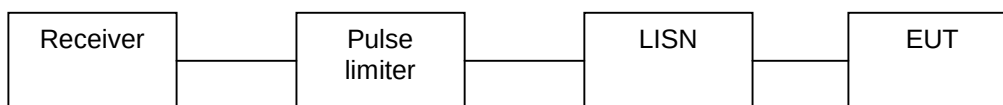
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2. Test setups

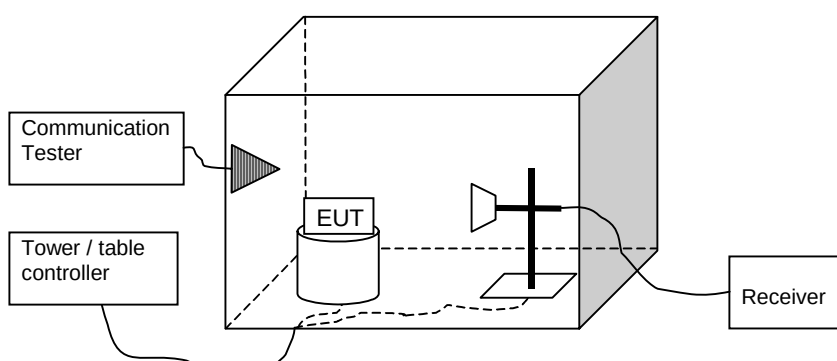
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Spurious radiated emissions test setup



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

EUT with DUT number	RM-313, DUT 12187
Accessories with DUT numbers	BP-6MT, DUT 12189; HS-23, DUT 12190; AC-5E, DUT 11998
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 100
Date of measurements	11.09.2007-12.09.2007
Measured by	Anni Manninen

3.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for conducted peak output power measurements

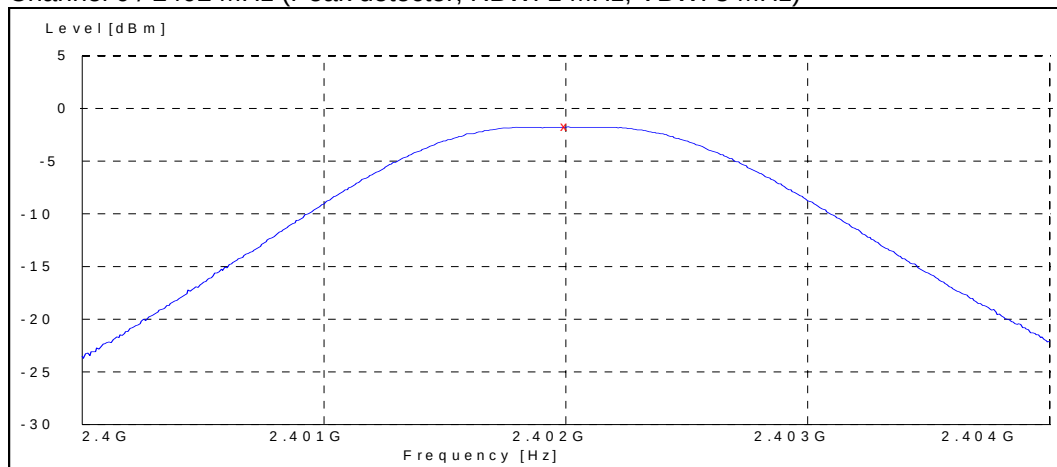
Frequency range [MHz]	Limit [W]	Limit [dBm]
2400 – 2483.5	≤ 1	≤ 30

3.2. Bluetooth Test results

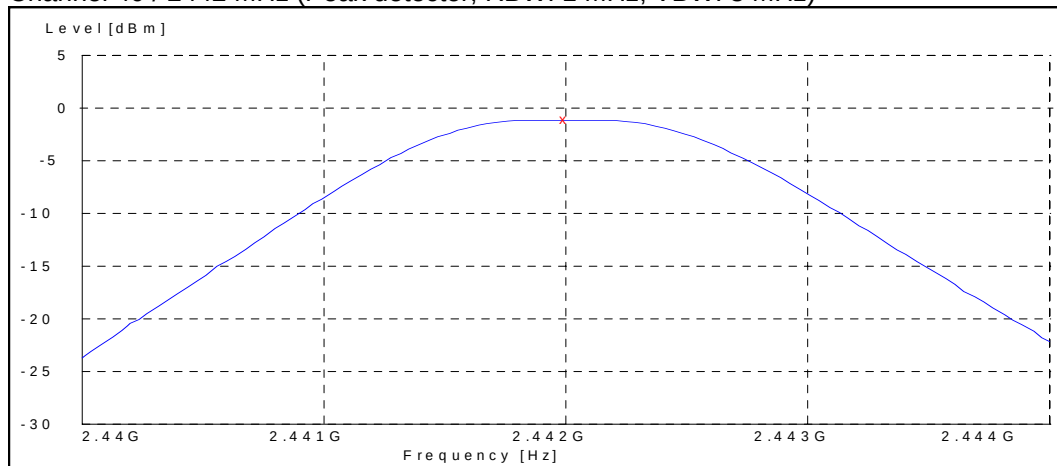
3.2.1 GFSK modulation, PRBS packet type

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
0 / 2402	-1.70	0.676	PASSED
40 / 2442	-1.10	0.776	PASSED
78 / 2480	-1.80	0.661	PASSED

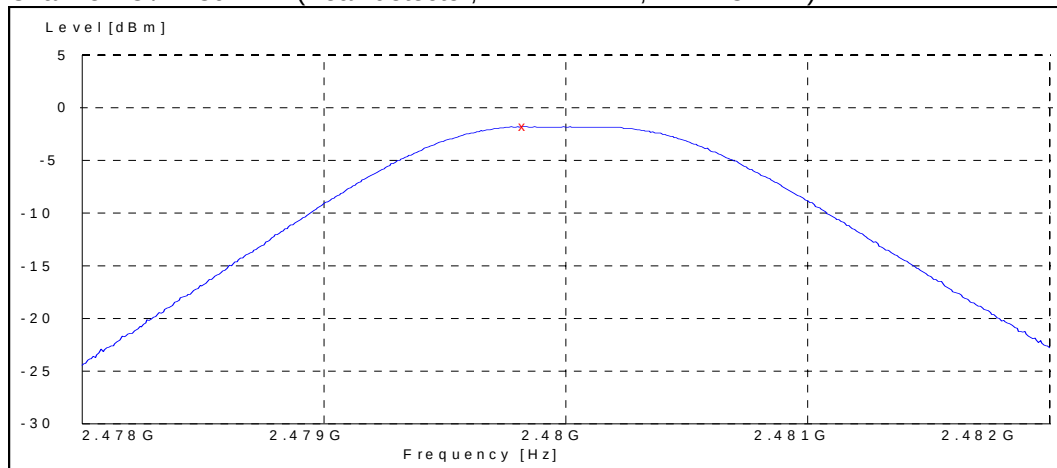
Channel 0 / 2402 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



Channel 40 / 2442 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



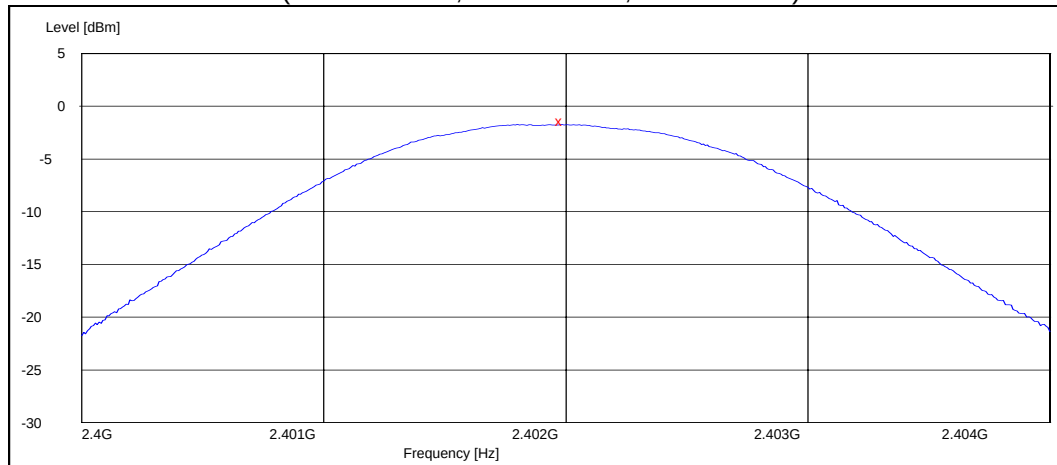
Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



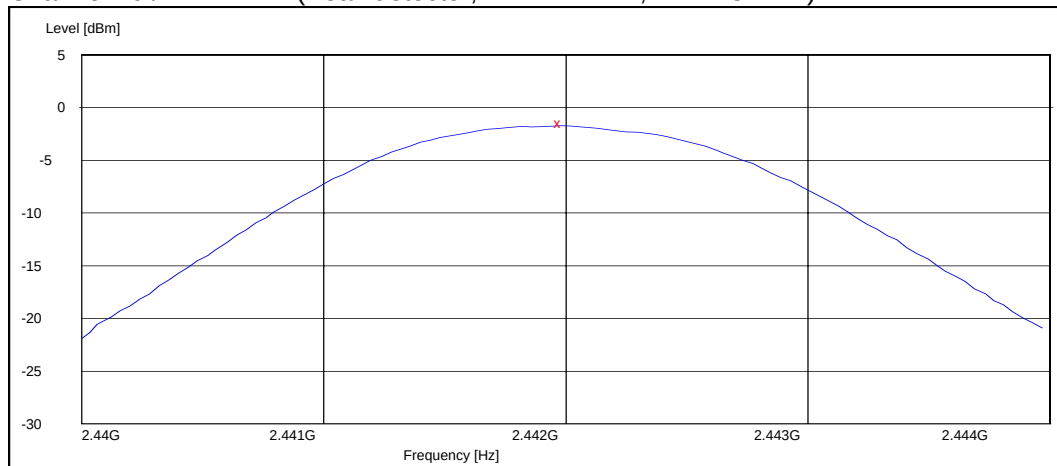
3.2.2 8DPSK modulation, PRBS packet type

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
0 / 2402	-1.40	0.724	PASSED
40 / 2442	-1.50	0.708	PASSED
78 / 2480	-2.30	0.589	PASSED

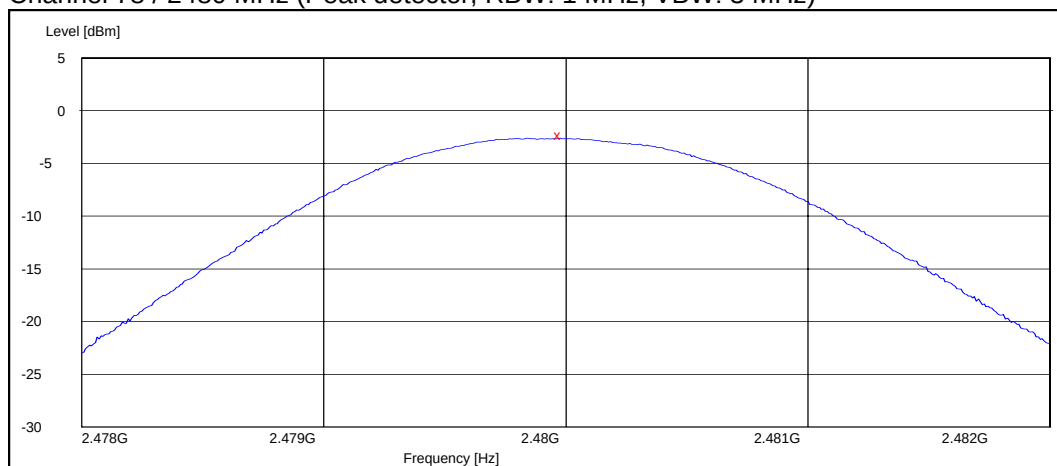
Channel 0 / 2402 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



Channel 40 / 2442 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



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

EUT with DUT number	RM-313, DUT 12225
Accessories with DUT numbers	BP-6MT, DUT 12230; HS-43, DUT 12190; AC-5E, DUT 11998
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 40 / 99.9
Date of measurements	19.09.2007
Measured by	Sami Lehtonen

4.1. Test method and limit

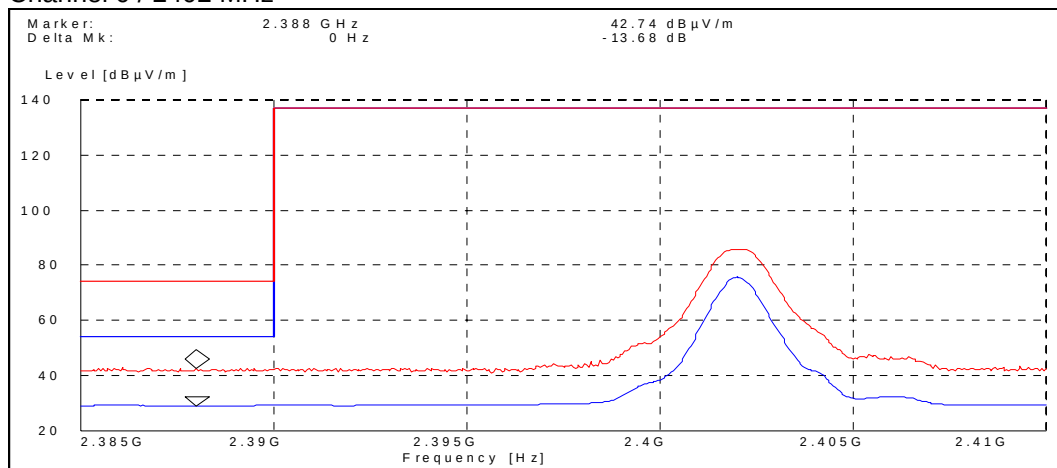
The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

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

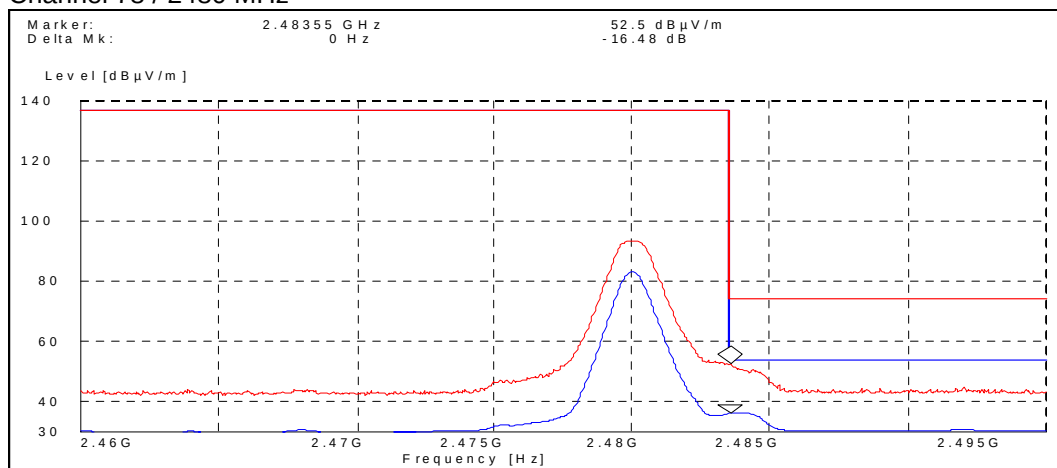
4.2. Bluetooth Test results

Channel 0 / 2402 MHz



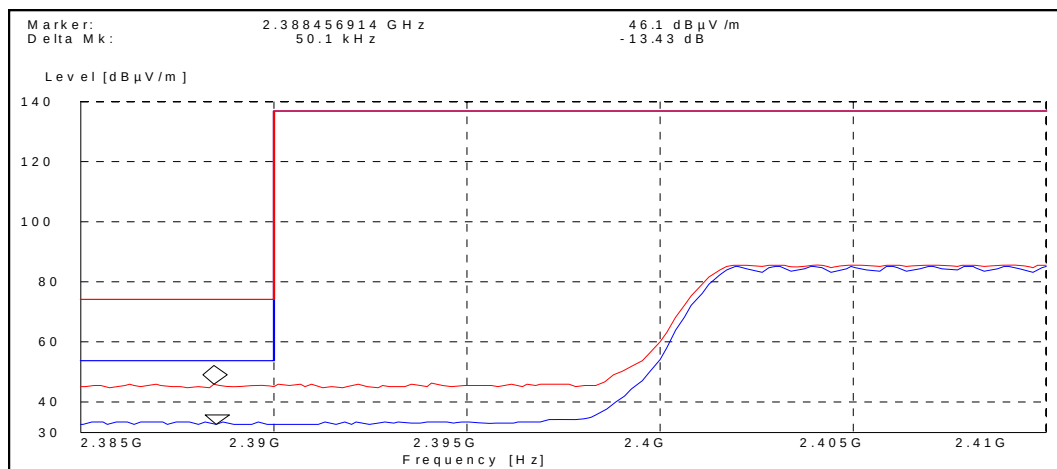
Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	42.74	PASSED
Average	29.06	PASSED

Channel 78 / 2480 MHz



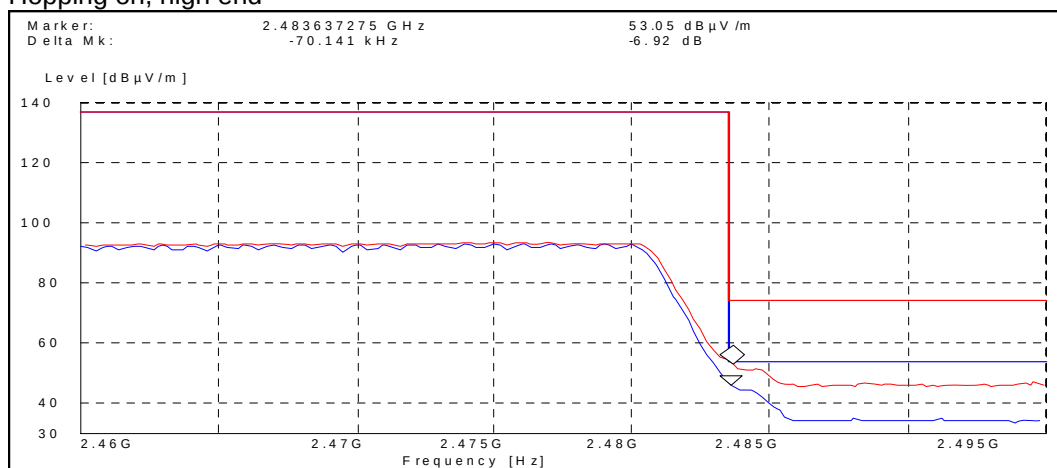
Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	52.50	PASSED
Average	36.02	PASSED

Hopping on, low end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	46.10	PASSED
Average	32.67	PASSED

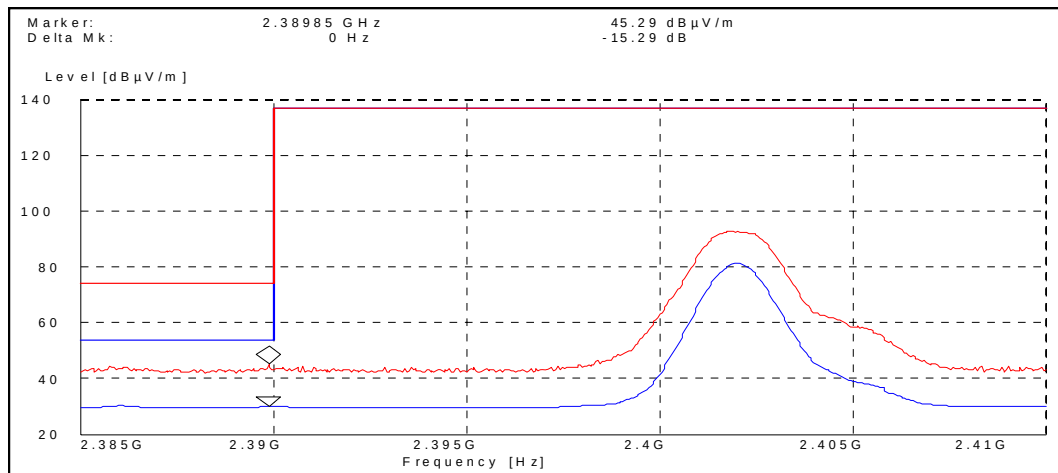
Hopping on, high end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	53.05	PASSED
Average	46.13	PASSED

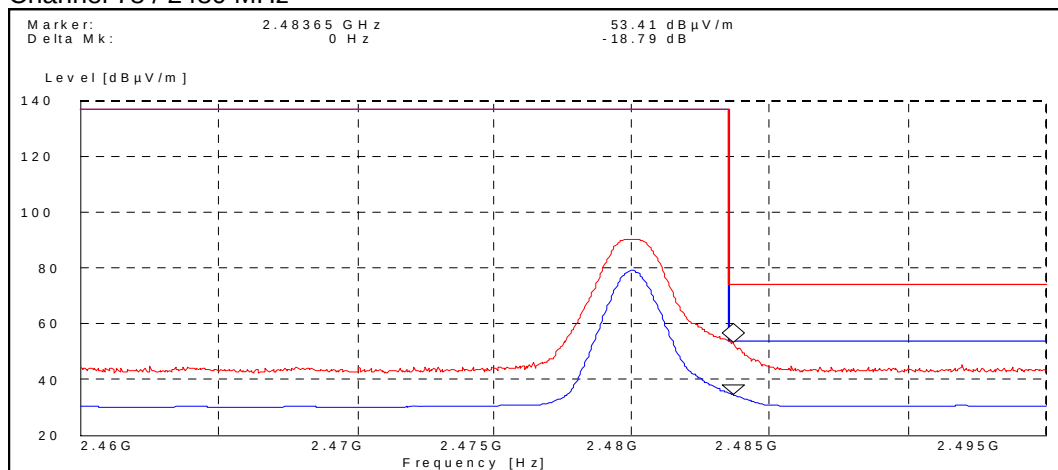
4.2.1 8DPSK modulation, PRBS packet type

Channel 0 / 2402 MHz



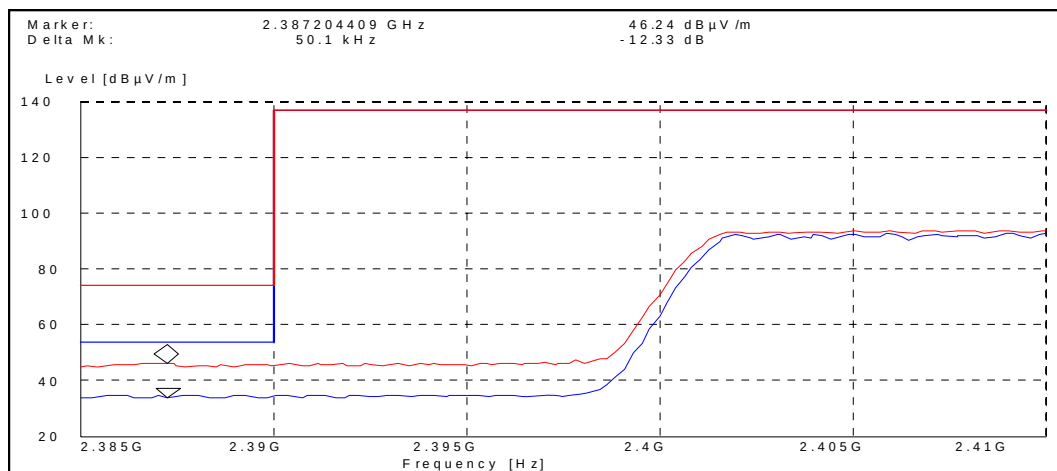
Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	45.29	PASSED
Average	30.00	PASSED

Channel 78 / 2480 MHz



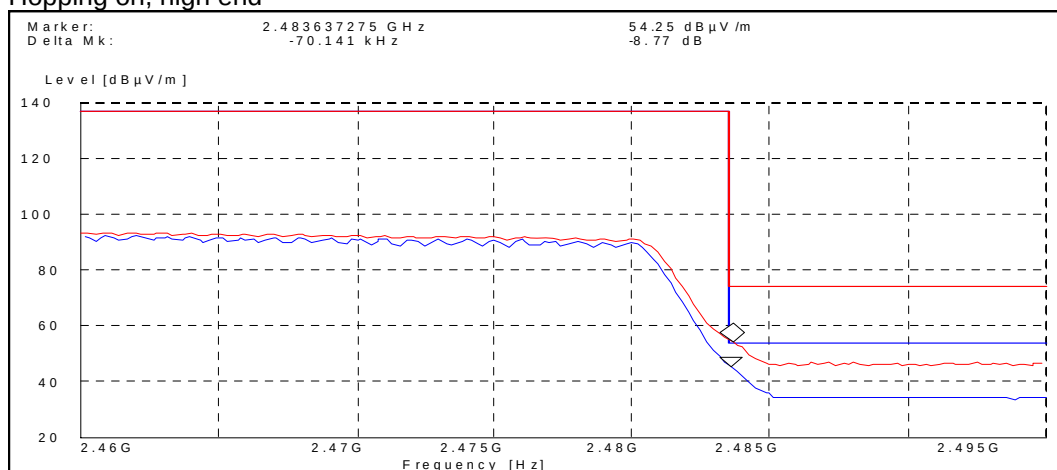
Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	53.41	PASSED
Average	34.62	PASSED

Hopping on, low end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	46.24	PASSED
Average	33.91	PASSED

Hopping on, high end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	54.25	PASSED
Average	45.48	PASSED

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

EUT with DUT number	RM-313, DUT 12187
Accessories with DUT numbers	BP-6MT, DUT 12189; HS-23, DUT 12190; AC-5E, DUT 11998
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 100
Date of measurements	11.09.2007-12.09.2007
Measured by	Anni Manninen

5.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

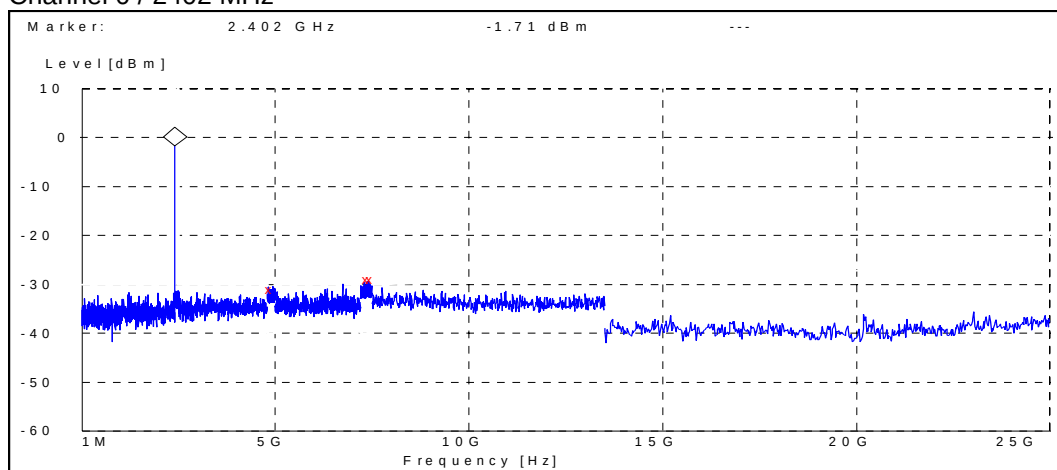
Limits for spurious RF conducted emissions measurements

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

5.2. Bluetooth Test results

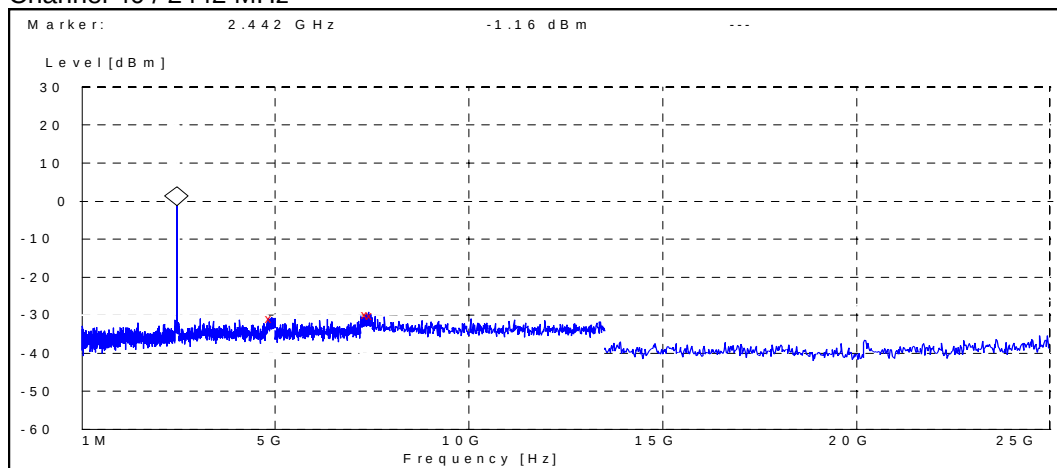
5.2.1 GFSK modulation, PRBS packet type

Channel 0 / 2402 MHz



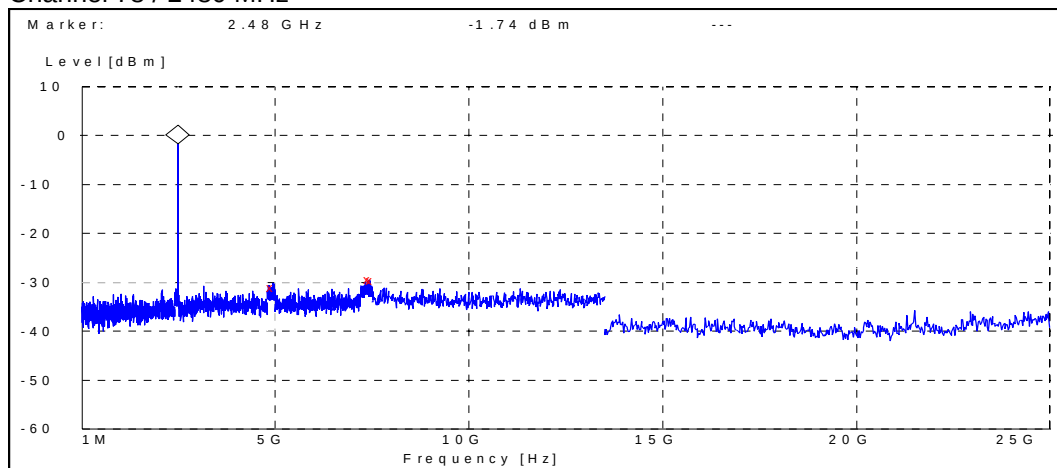
Frequency [MHz]	P [dBc]	Result
4919.600000	-29.287538	PASSED
7413.600000	-27.387538	PASSED
7500.000000	-27.387538	PASSED

Channel 40 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4908.800000	-29.636934	PASSED
7395.000000	-28.536934	PASSED
7500.000000	-28.936934	PASSED

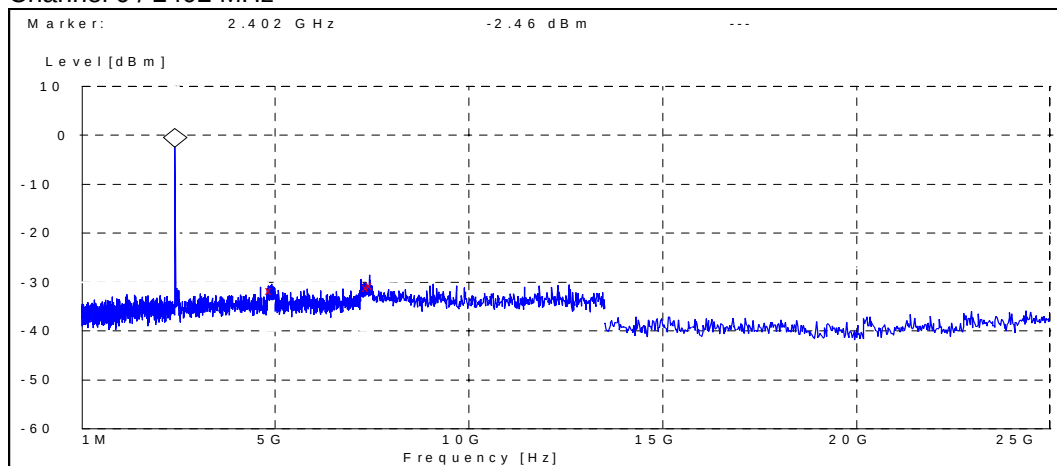
Channel 78 / 2480 MHz



Frequency [MHz]	P [dBc]	Result
4942.000000	-29.361038	PASSED
7435.200000	-27.661038	PASSED
7500.000000	-27.861038	PASSED

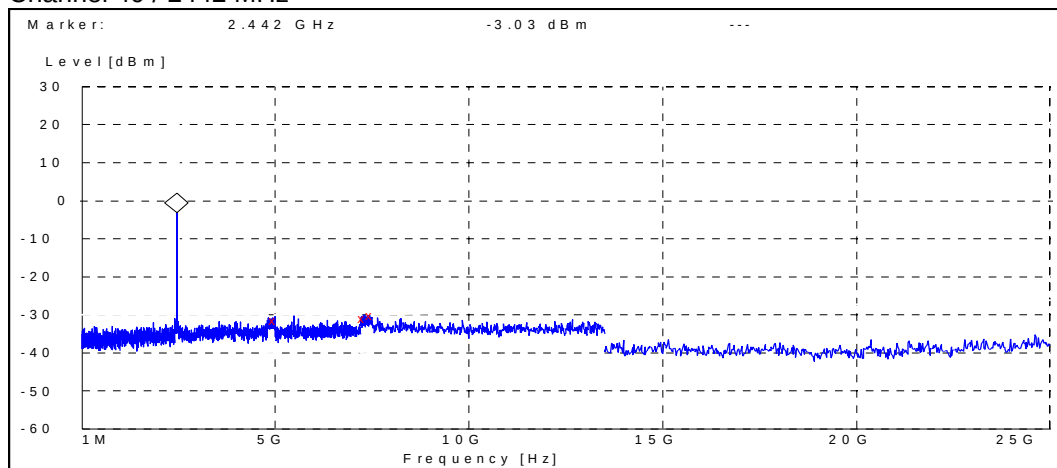
5.2.2 8DPSK modulation, PRBS packet type

Channel 0 / 2402 MHz



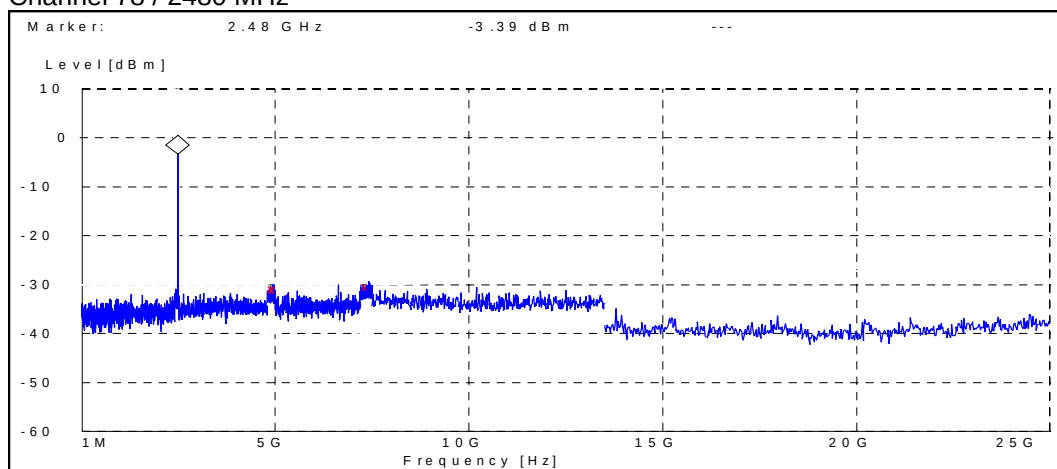
Frequency [MHz]	P [dBc]	Result
4904.800000	-29.236493	PASSED
7423.800000	-28.736493	PASSED
7500.000000	-28.336493	PASSED

Channel 40 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4996.400000	-28.466763	PASSED
7294.800000	-27.966763	PASSED
7500.000000	-27.066763	PASSED

Channel 78 / 2480 MHz



Frequency [MHz]	P [dBc]	Result
4956.000000	-27.310411	PASSED
5000.000000	-27.510411	PASSED
7396.800000	-27.010411	PASSED

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

EUT with DUT number	RM-313, DUT 12226
Accessories with DUT numbers	BP-6MT, DUT 12189; HS-23, DUT 12190; AC-5E, DUT 11998
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 100
Date of measurements	11.09.2007-12.09.2007
Measured by	Anni Manninen

6.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-GEN as follows:

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

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

The measurement results are obtained as described below:

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

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

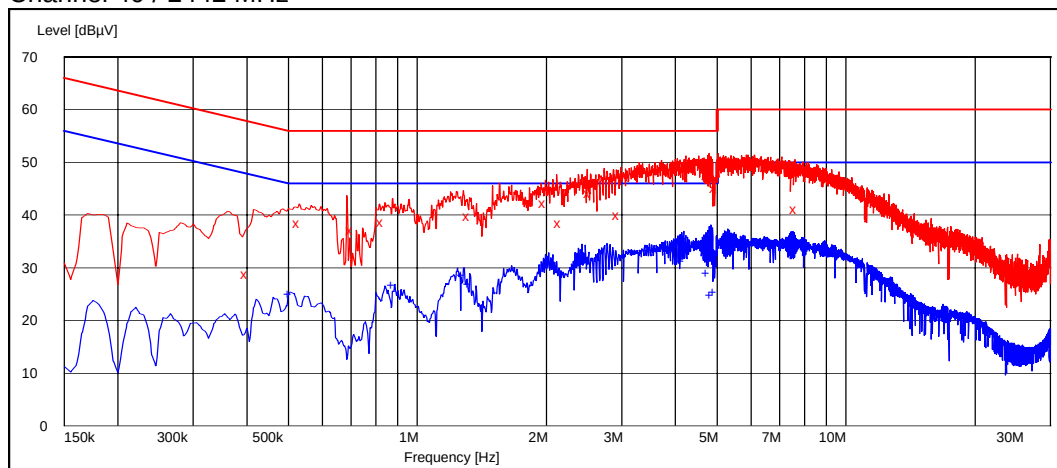
CISPR 22 Class B limits

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

6.2. Bluetooth Test results

6.2.1 GFSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

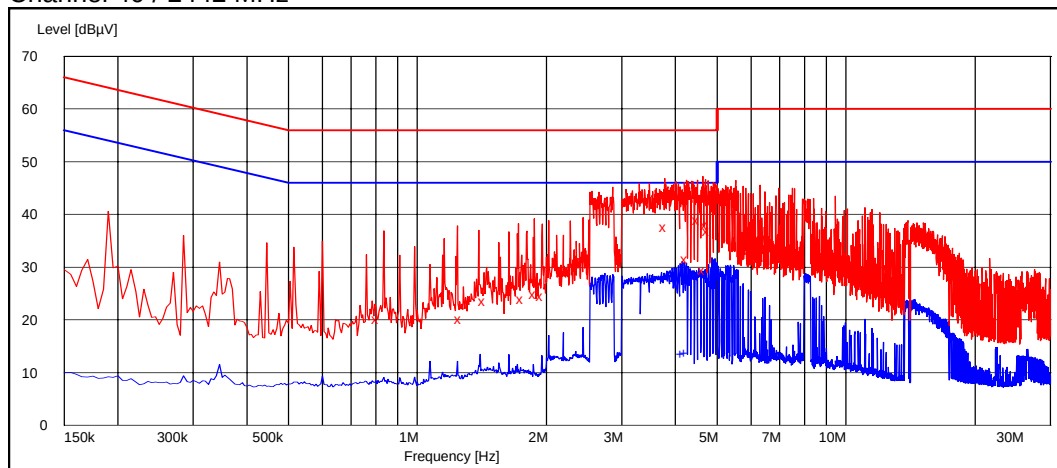
Frequency [MHz]	U [dBμV]	Line	Result
0.400000	28.80	L1	PASSED
0.530000	38.50	N	PASSED
0.705000	37.20	N	PASSED
0.830000	38.60	N	PASSED
1.320000	39.90	N	PASSED
1.985000	42.20	N	PASSED
2.155000	38.50	L1	PASSED
2.530000	44.10	N	PASSED
2.950000	40.00	L1	PASSED
4.775000	47.60	N	PASSED
4.980000	45.10	N	PASSED
7.640000	41.20	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.505000	25.00	N	PASSED
0.880000	26.70	N	PASSED
1.280000	28.70	N	PASSED
1.325000	27.00	N	PASSED
1.985000	30.50	N	PASSED
4.165000	31.20	N	PASSED
4.775000	29.00	N	PASSED
4.835000	31.90	N	PASSED
4.865000	24.80	N	PASSED
4.950000	25.40	N	PASSED

6.2.2 8DPSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.810000	20.10	N	PASSED
1.260000	20.20	N	PASSED
1.435000	23.50	N	PASSED
1.760000	24.00	L1	PASSED
1.885000	24.80	N	PASSED
1.955000	24.60	N	PASSED
3.795000	37.60	L1	PASSED
4.260000	31.50	N	PASSED
4.535000	39.00	L1	PASSED
4.670000	29.50	N	PASSED
4.740000	37.90	L1	PASSED
4.780000	36.80	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
4.155000	13.50	L1	PASSED
4.240000	13.80	L1	PASSED

7. 20 dB bandwidth (FCC §15.247(a)(1), RSS-210 A8.1 (1))

EUT with DUT number	RM-313, DUT 12187
Accessories with DUT numbers	BP-6MT, DUT 12189; HS-23, DUT 12190; AC-5E, DUT 11998
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 100
Date of measurements	11.09.2007-12.09.2007
Measured by	Anni Manninen

7.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for 20 dB bandwidth measurements

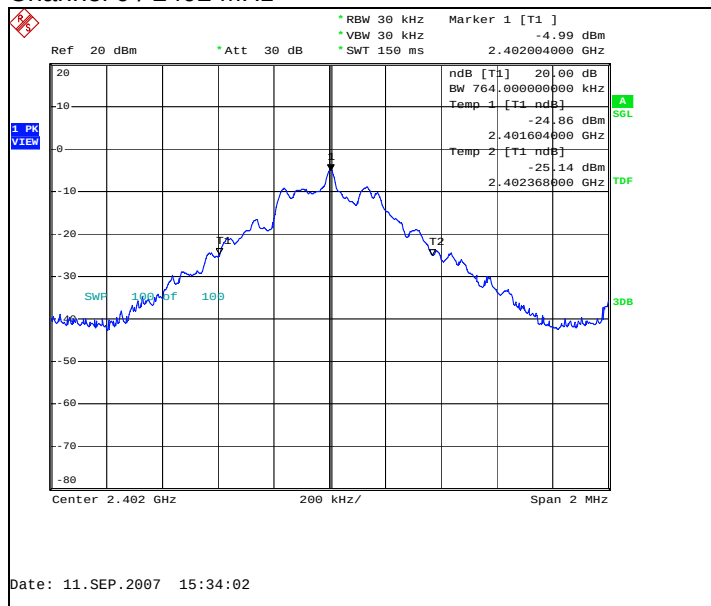
Limit [MHz]
N/A

7.2. Bluetooth Test results

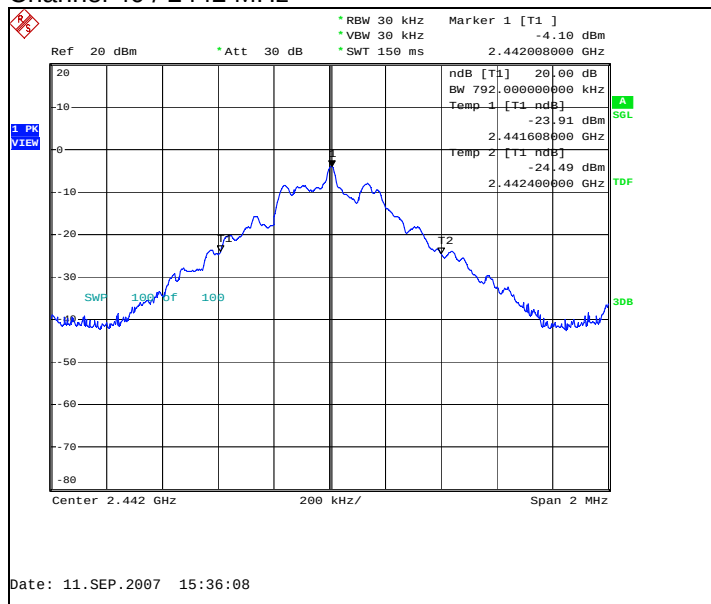
7.2.1 GFSK modulation, PRBS packet type

Channel / f_c [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	764.000	PASSED
40 / 2442	792.000	PASSED
78 / 2480	764.000	PASSED

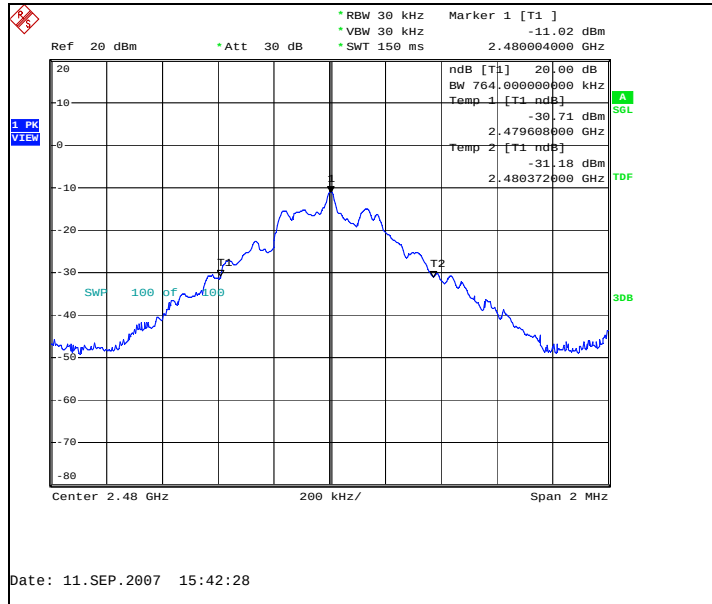
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



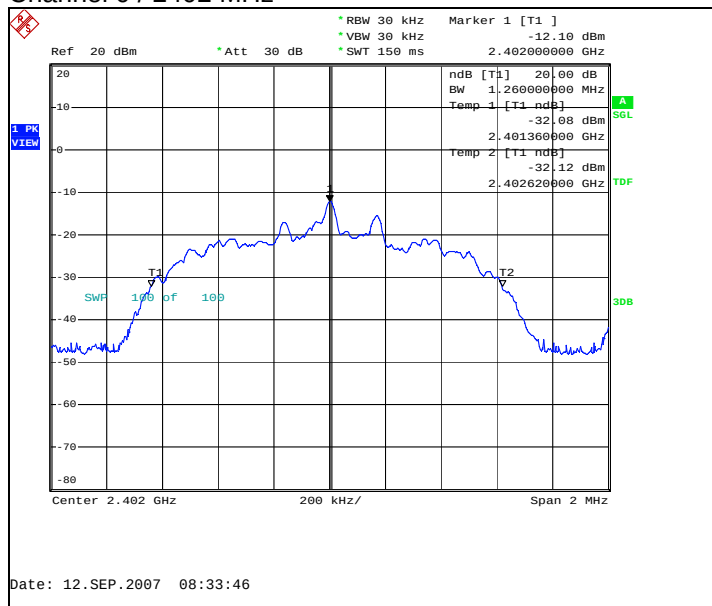
Channel 78 / 2480 MHz



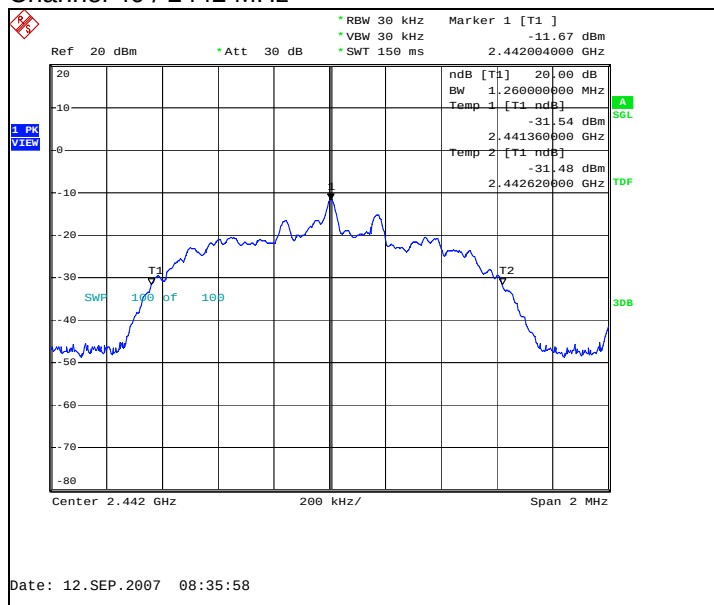
7.2.2 8DPSK modulation, PRBS packet type

Channel / f_c [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	1260.000	PASSED
40 / 2442	1260.000	PASSED
78 / 2480	1260.000	PASSED

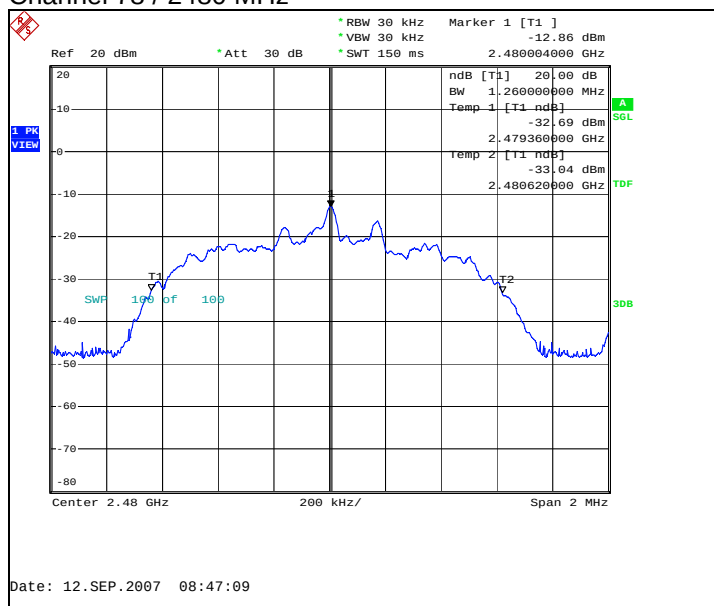
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



Channel 78 / 2480 MHz



8. Carrier frequency separation (FCC §15.247(a)(1), RSS-210 A8.1 (2))

EUT with DUT number	RM-313, DUT 12187
Accessories with DUT numbers	BP-6MT, DUT 12189; HS-23, DUT 12190; AC-5E, DUT 11998
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 100
Date of measurements	11.09.2007-12.09.2007
Measured by	Anni Manninen

8.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for carrier frequency separation measurements

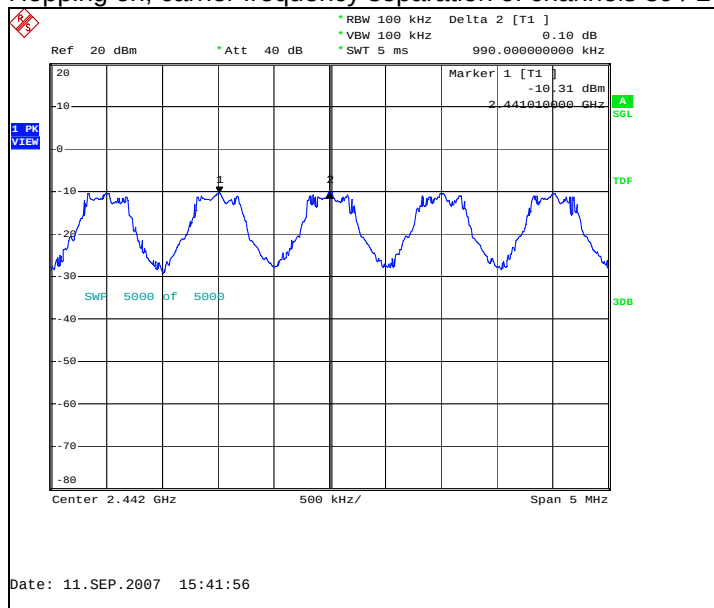
Limit [MHz]
≥ 0.025 or $2/3$ of the 20 dB bandwidth

8.2. Bluetooth Test results

8.2.1 GFSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
990	PASSED

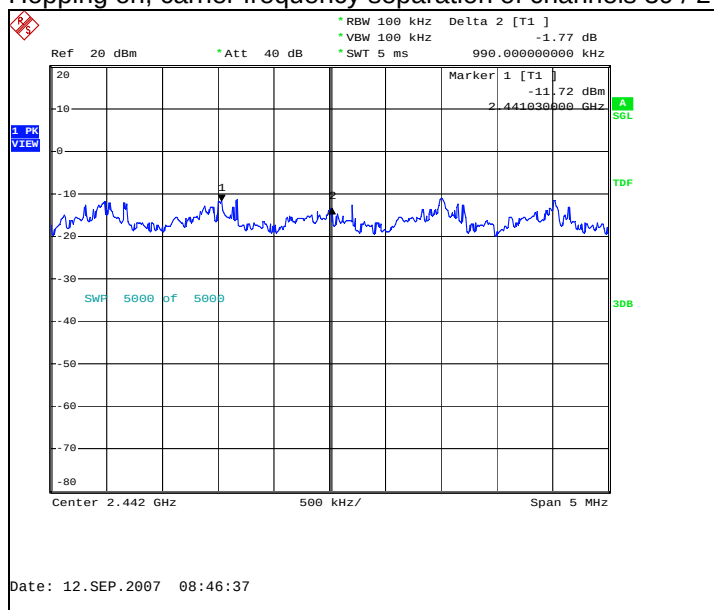
Hopping on, carrier frequency separation of channels 39 / 2441 MHz and 40 / 2442 MHz



8.2.2 8DPSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
990	PASSED

Hopping on, carrier frequency separation of channels 39 / 2441 MHz and 40 / 2442 MHz



9. Number of hopping frequencies (FCC §15.247(a)(1)(iii), RSS-210 A8.1 (4))

EUT with DUT number	RM-313, DUT 12287
Accessories with DUT numbers	BP-6MT, DUT 12189; HS-23, DUT 12190; AC-5E, DUT 11998
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 100
Date of measurements	11.09.2007-12.09.2007
Measured by	Anni Manninen

9.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for number of hopping frequencies measurements

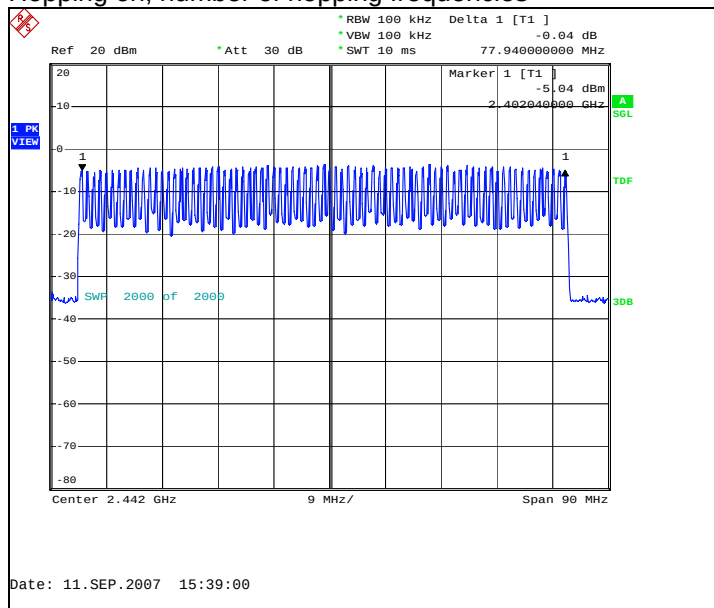
Limit [number]
≥ 15

9.2. Bluetooth Test results

9.2.1 GFSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
79	PASSED

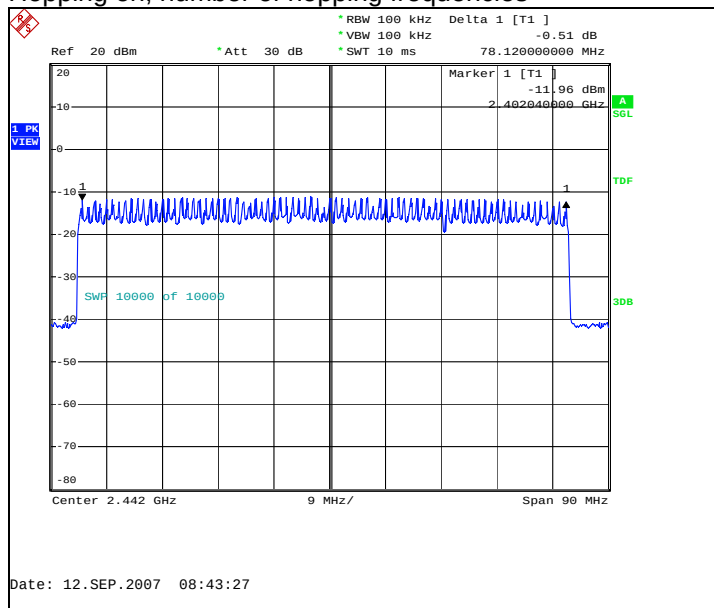
Hopping on, number of hopping frequencies



9.2.2 8DPSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
70	PASSED

Hopping on, number of hopping frequencies



10. Time of occupancy (FCC §15.247(a)(1)(iii), RSS-210 A8.1 (4))

EUT with DUT number	RM-313, DUT 12187
Accessories with DUT numbers	BP-6MT, DUT 12189; HS-23, DUT 12190; AC-5E, DUT 11998
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 100
Date of measurements	11.09.2007-12.09.2007
Measured by	Anni Manninen

10.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210 as follows:

The total time of occupancy is get by multiplying the measured number of transmissions occurred during 31.6 second period with the duration of one transmission.

Limits for time of occupancy measurements

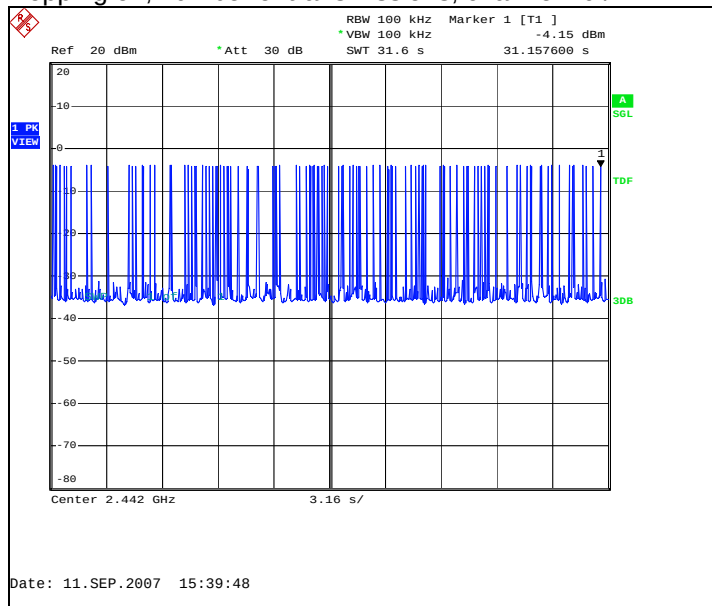
Limit [s]
≤ 0.4

10.2. Bluetooth test results

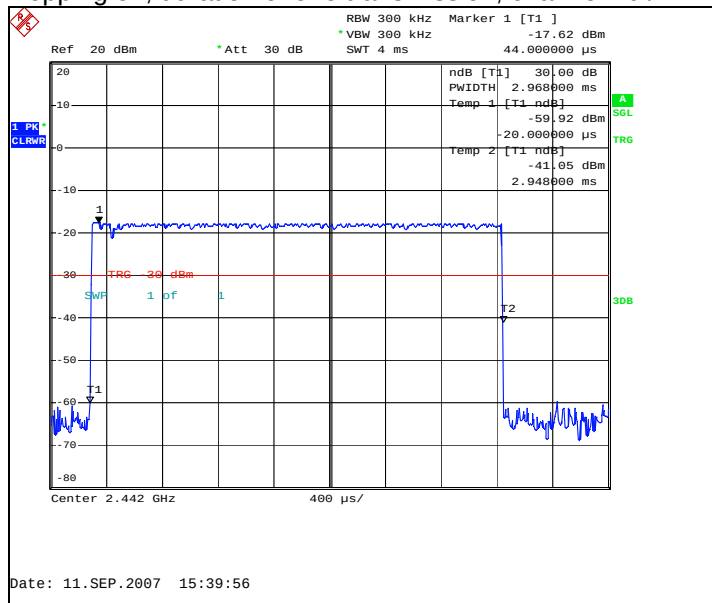
10.2.1 GFSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [μ s]	Time of occupancy [s]	Result
90	2 968	0.267120	PASSED

Hopping on, number of transmissions, channel 40 / 2442 MHz



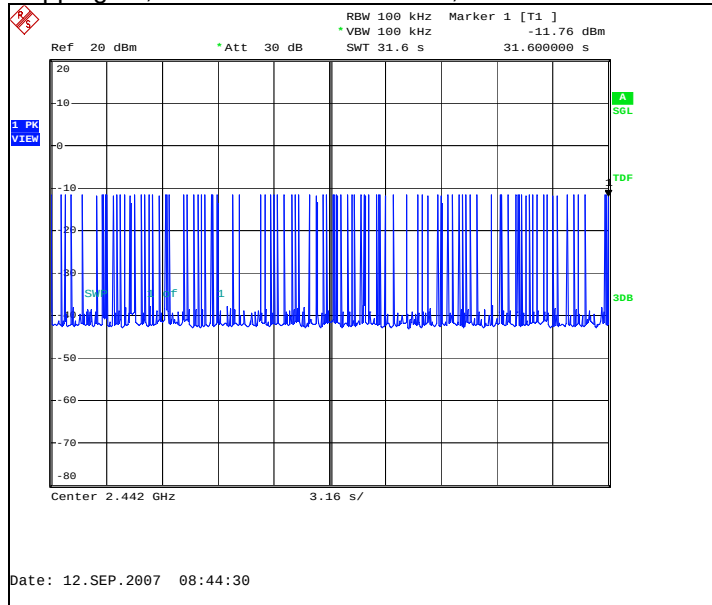
Hopping on, duration of one transmission, channel 40 / 2442 MHz



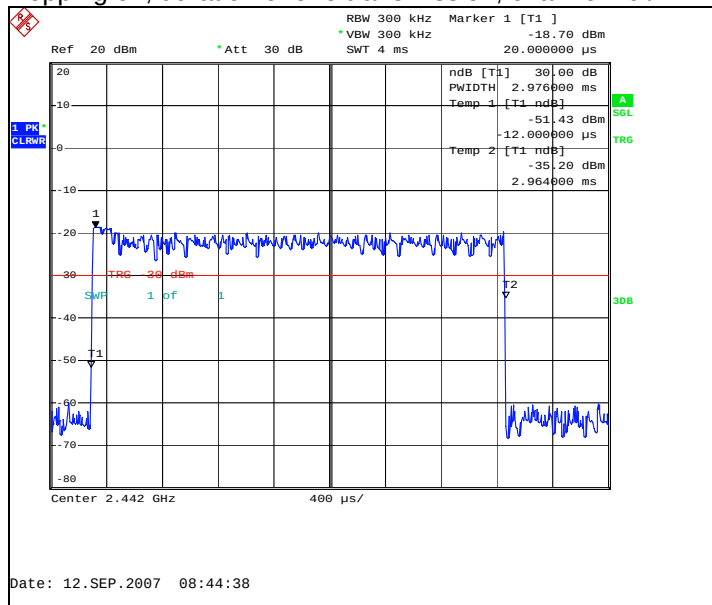
10.2.2 8DPSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [μ s]	Time of occupancy [s]	Result
90	2 976	0.267840	PASSED

Hopping on, number of transmissions, channel 40 / 2442 MHz



Hopping on, duration of one transmission, channel 40 / 2442 MHz



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

EUT with DUT number	RM-313, DUT 12188
Accessories with DUT numbers	BP-6MT, DUT 12189; HS-23, DUT 12190; AC-5E, DUT 11998
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 100
Date of measurements	11.09.2007
Measured by	Anni Manninen

11.1. 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

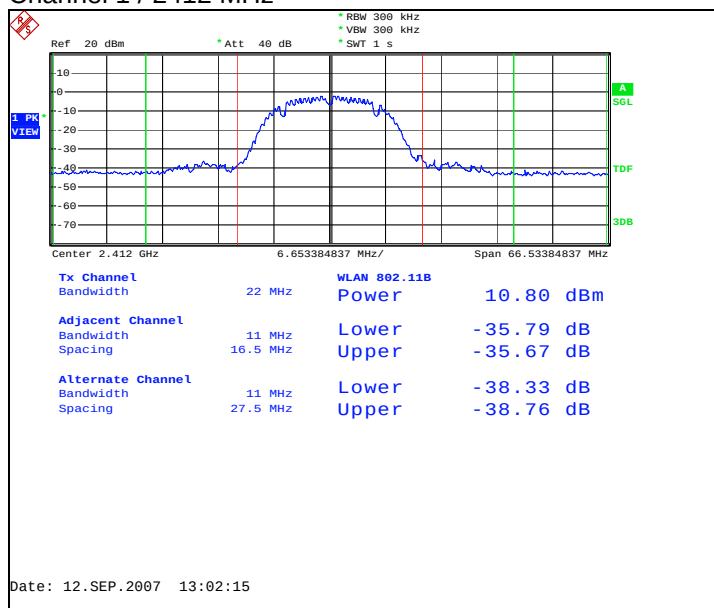
Frequency range [MHz]	Limit [W]	Limit [dBm]
2400 – 2483.5	≤ 1	≤ 30

11.2. WLAN Test results

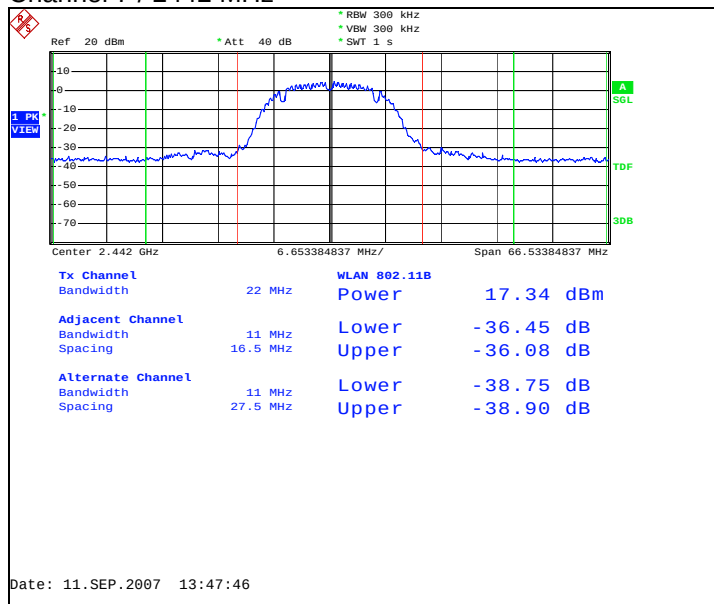
11.2.1 DSSS mode, BPSK modulation, 1 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [W]	Result
1 / 2412	10.80	0.012	PASSED
7 / 2442	16.54	0.045	PASSED
11 / 2462	16.56	0.045	PASSED

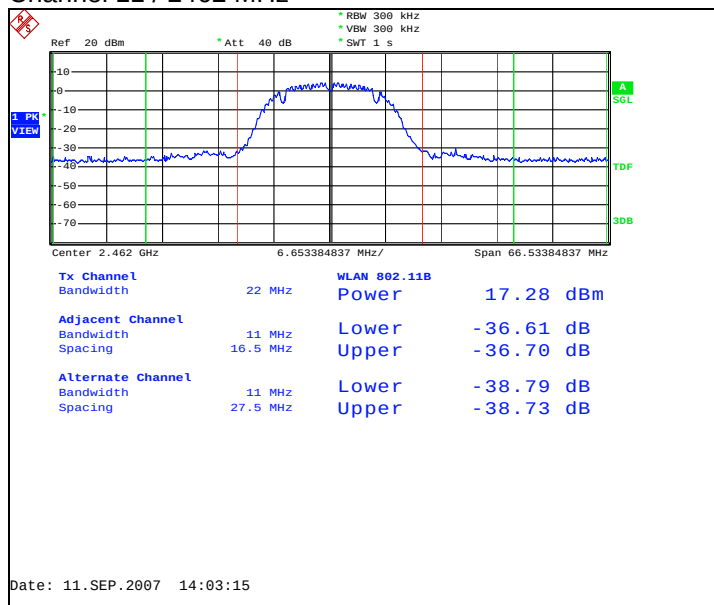
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



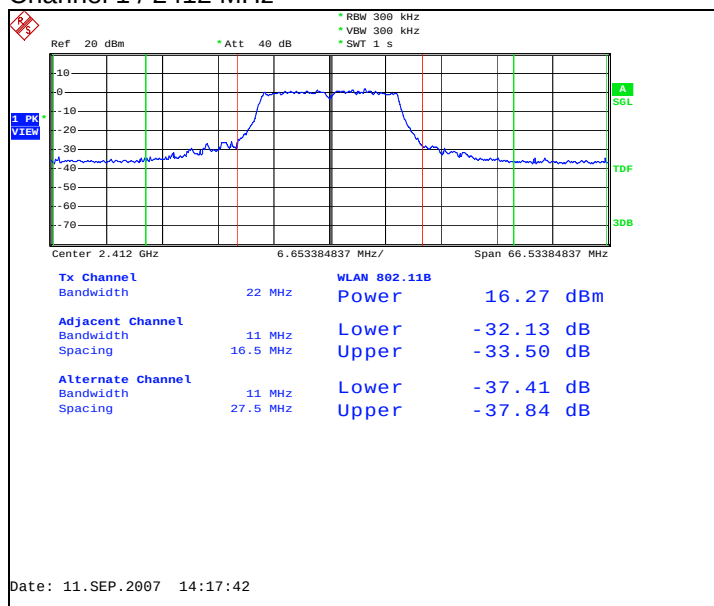
Channel 11 / 2462 MHz



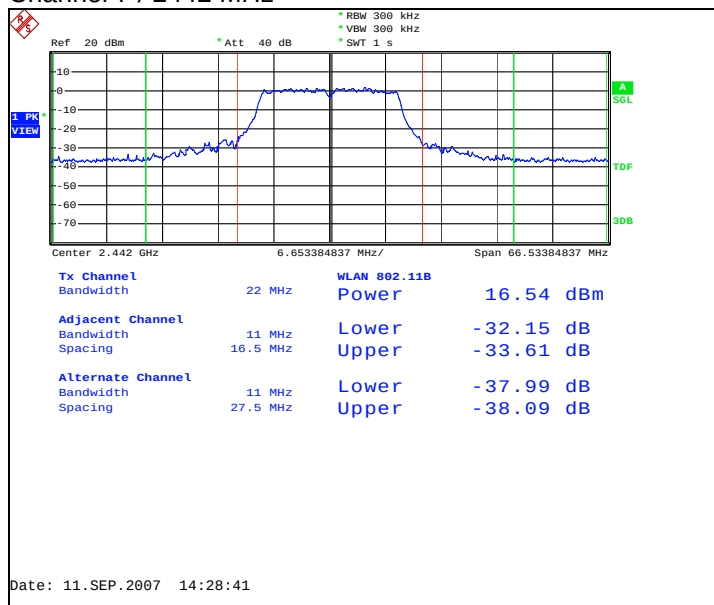
11.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [W]	Result
1 / 2412	16.27	0.042	PASSED
7 / 2442	16.54	0.045	PASSED
11 / 2462	16.56	0.045	PASSED

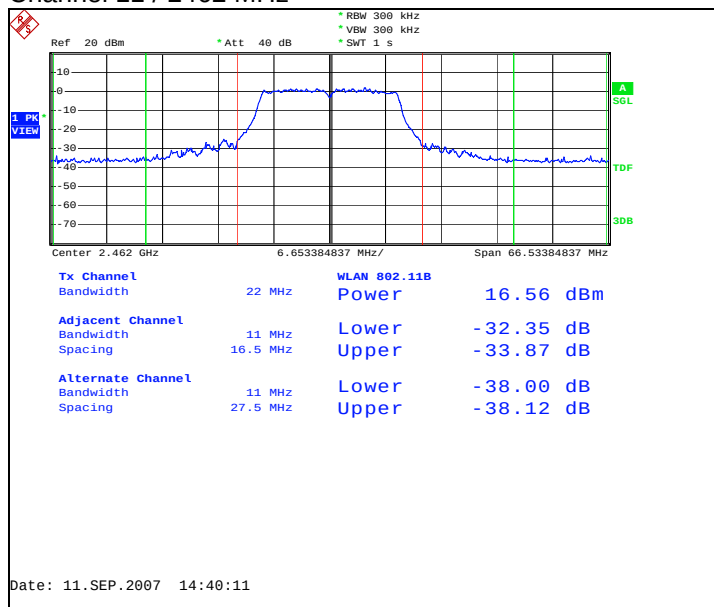
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



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

EUT with DUT number	RM-313, DUT 12225
Accessories with DUT numbers	BP-6MT, DUT 12230; HS-43, DUT 12190; AC-5E, DUT 11998
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 40 / 99.9
Date of measurements	19.09.2007
Measured by	Sami Lehtonen

12.1. 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)

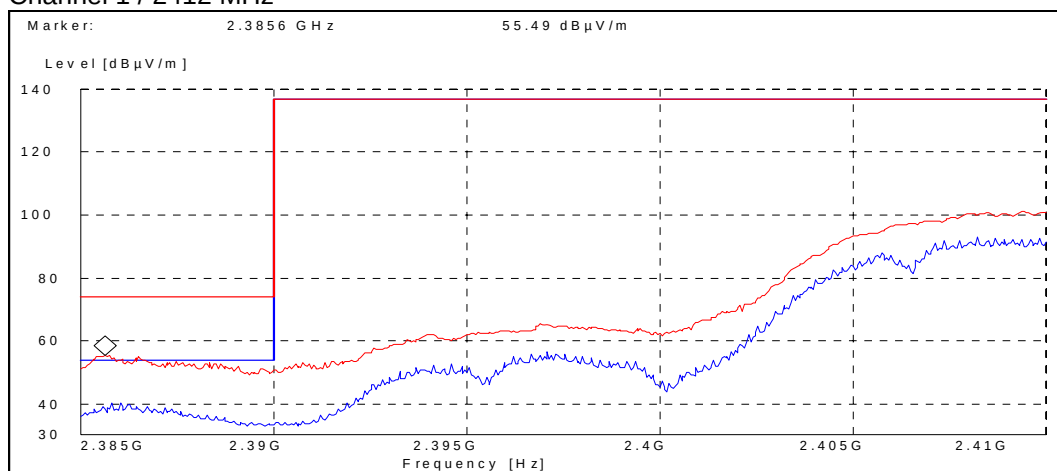
Frequency range [MHz]	Limit Average [dBμV/m]	Limit Peak [dBμV/m]
Below 2390 and above 2483.5	≤ 54	≤ 74

12.2. WLAN Test results

12.2.1 DSSS mode, BPSK modulation, 1 Mbps data rate

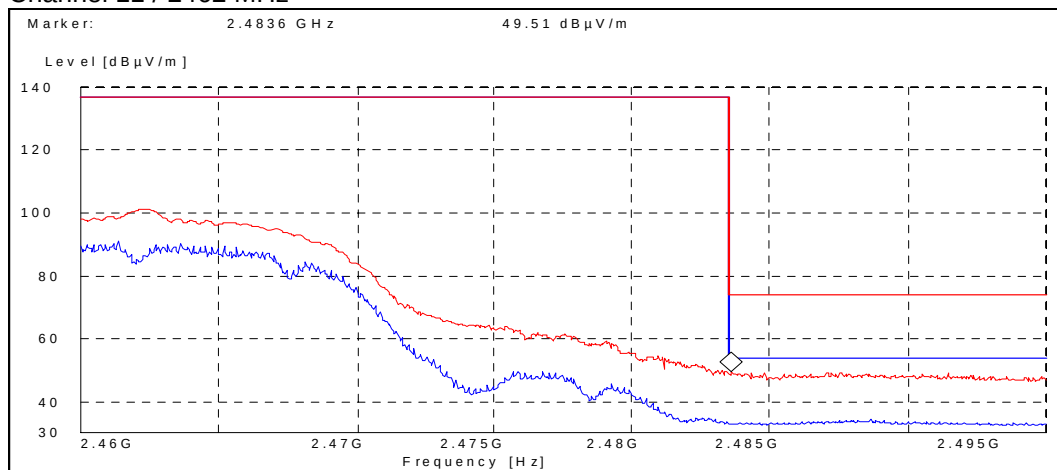
Channel 1 / 2412 MHz

Channel 1 / 2412 MHz



Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	55.50	PASSED
Average	40.20	PASSED

Channel 11 / 2462 MHz

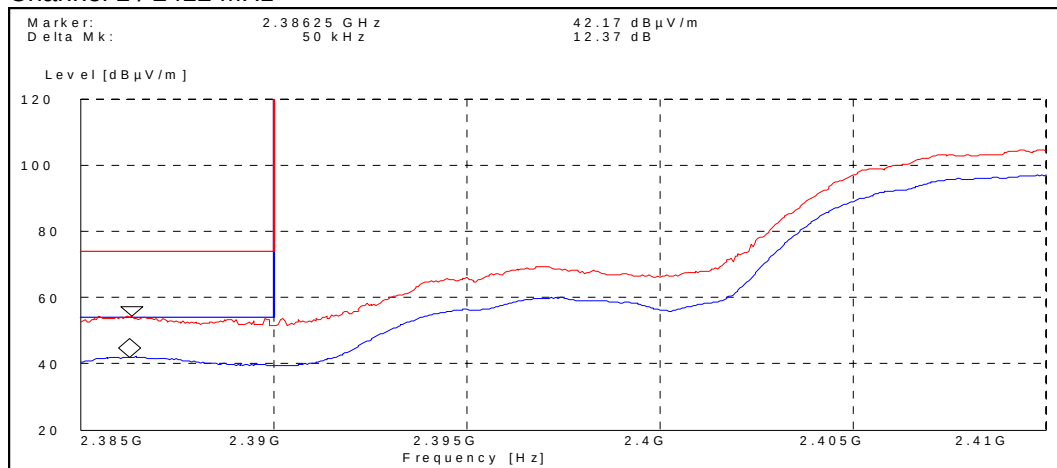


Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	49.50	PASSED
Average	34.30	PASSED

12.2.2 DSSS mode, QPSK modulation, 11 Mbps data rate

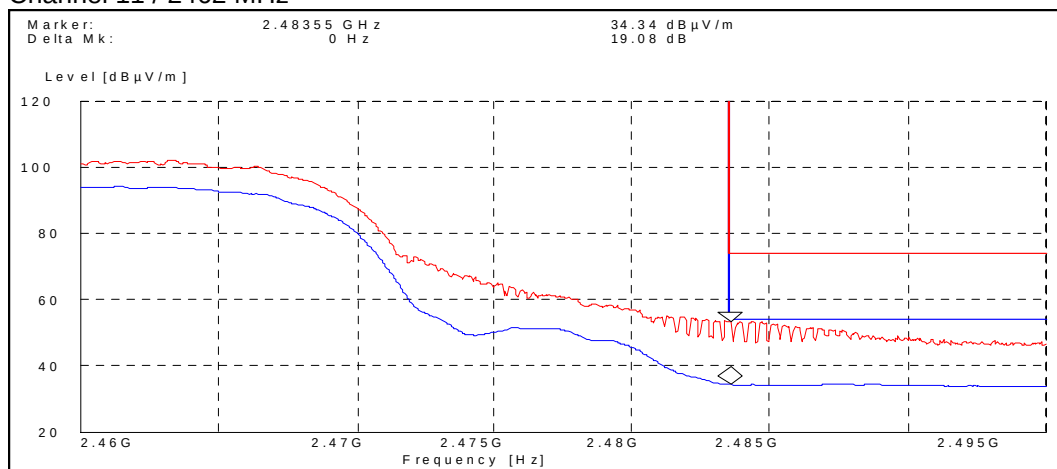
Channel 1 / 2412 MHz

Channel 1 / 2412 MHz



Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	54.54	PASSED
Average	42.17	PASSED

Channel 11 / 2462 MHz



Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	53.42	PASSED
Average	34.34	PASSED

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

EUT with DUT number	RM-313, DUT 12188
Accessories with DUT numbers	BP-6MT, DUT 12189; HS-23, DUT 12190; AC-5E, DUT 11998
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 100
Date of measurements	11.09.2007
Measured by	Anni Manninen

13.1. Test method and limit

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

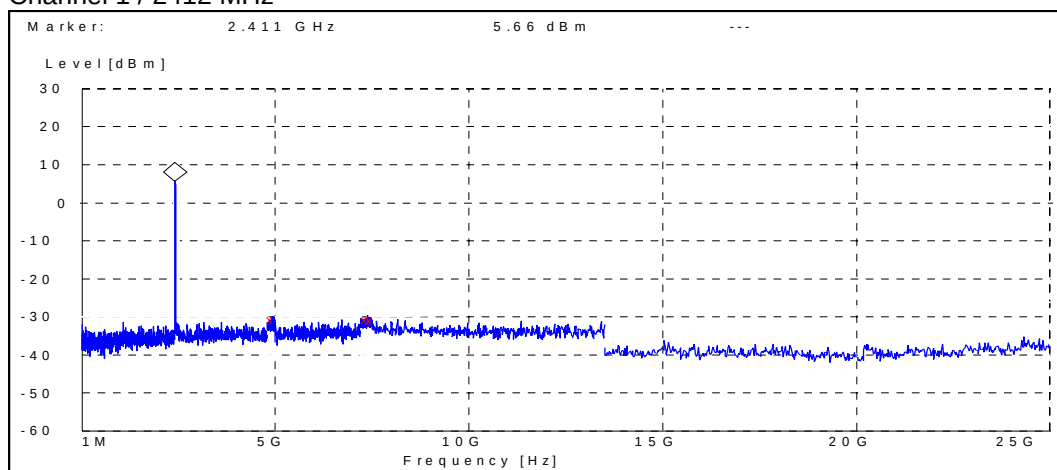
Limits for spurious RF conducted emissions measurements

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

13.2. WLAN Test results

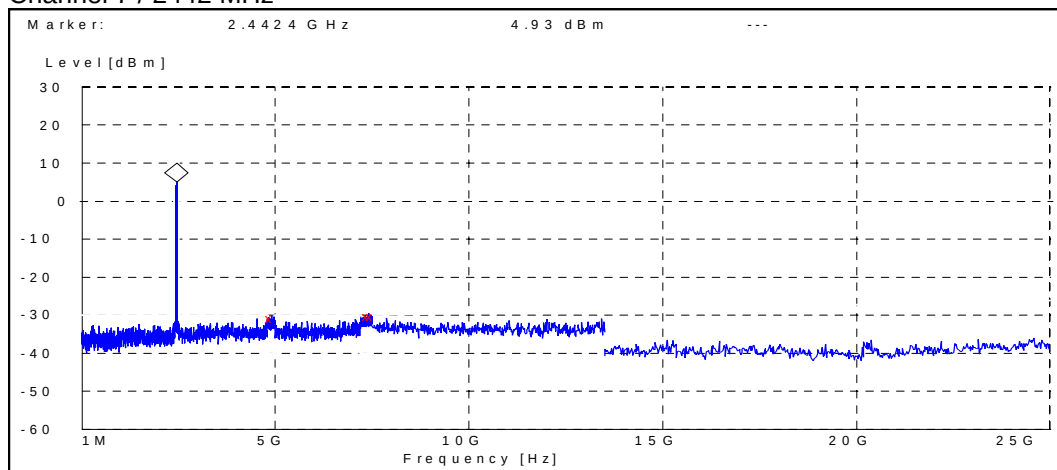
13.2.1 DSSS mode, BPSK modulation, 1 Mbps data rate

Channel 1 / 2412 MHz



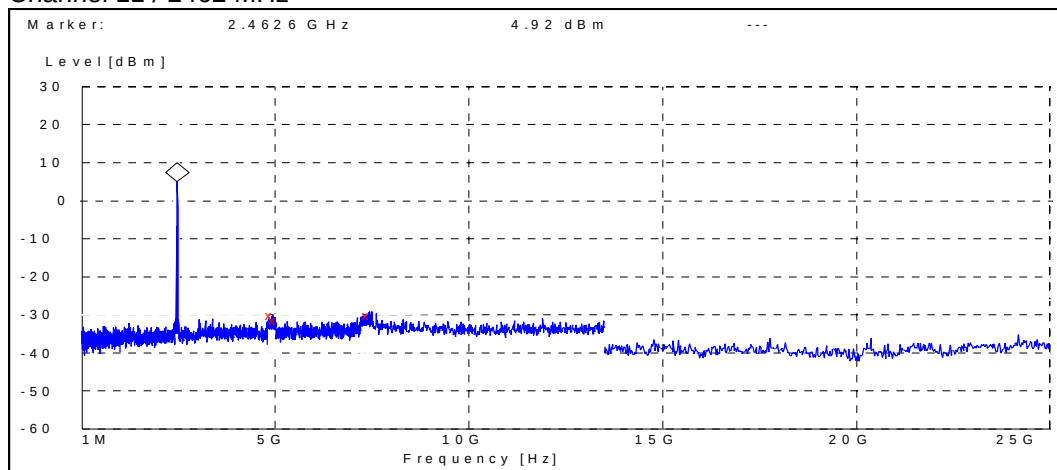
Frequency [MHz]	P [dBc]	Result
4933.200000	-36.162874	PASSED
7379.400000	-36.362874	PASSED
7500.000000	-36.562874	PASSED

Channel 7 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4914.000000	-35.832263	PASSED
7404.600000	-35.332263	PASSED
7500.000000	-35.232263	PASSED

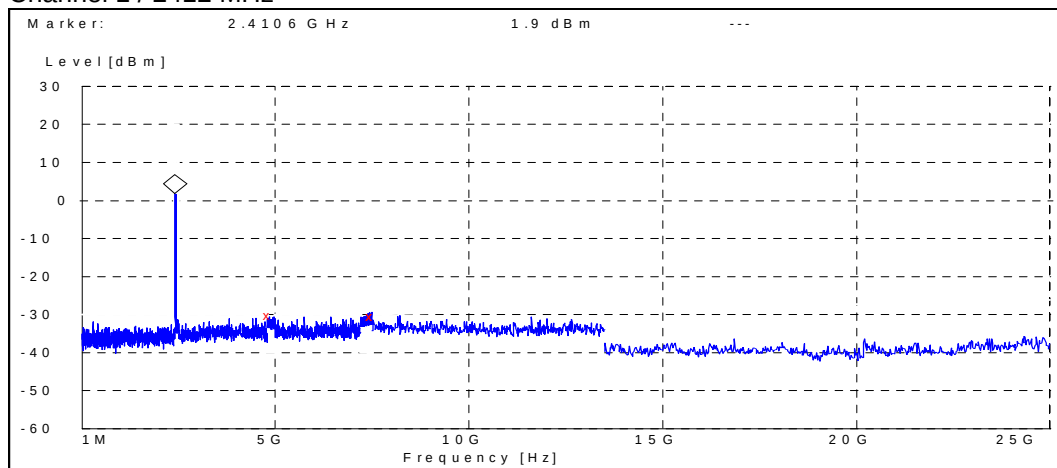
Channel 11 / 2462 MHz



Frequency [MHz]	P [dBc]	Result
4924.400000	-35.223172	PASSED
5000.000000	-36.423172	PASSED
7424.400000	-35.223172	PASSED

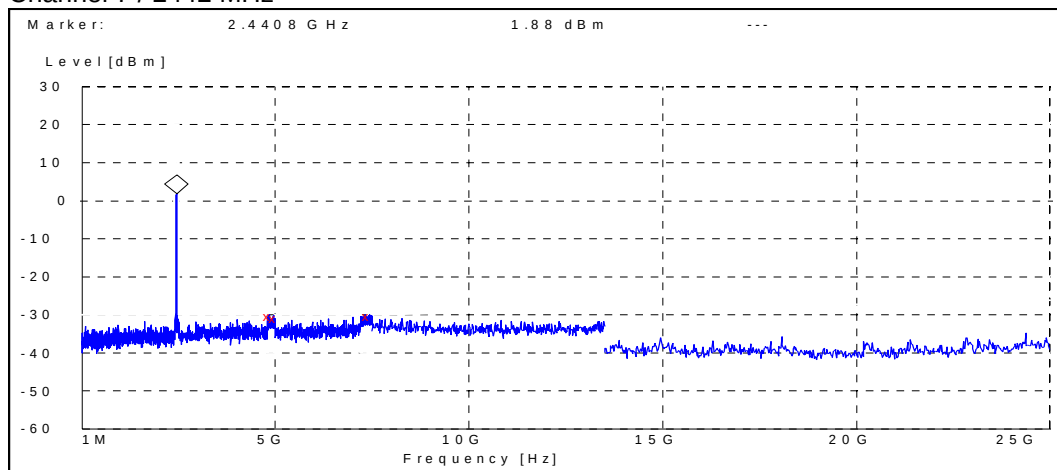
13.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 1 / 2412 MHz



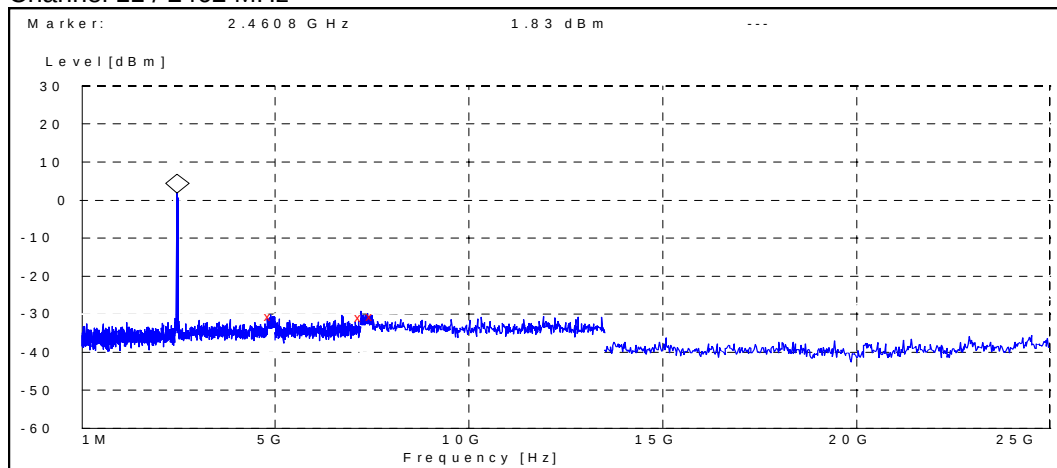
Frequency [MHz]	P [dBc]	Result
4837.600000	-32.195998	PASSED
7494.000000	-32.295998	PASSED
7500.000000	-32.295998	PASSED

Channel 7 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4839.600000	-32.278991	PASSED
5000.000000	-32.878991	PASSED
7422.600000	-32.378991	PASSED

Channel 11 / 2462 MHz



Frequency [MHz]	P [dBc]	Result
4885.600000	-32.327039	PASSED
7218.000000	-32.627039	PASSED
7500.000000	-32.427039	PASSED

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

EUT with DUT number	RM-313, DUT 12226
Accessories with DUT numbers	BP-6MT, DUT 12189; HS-23, DUT 12190; AC-5E, DUT 11998
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 100
Date of measurements	11.09.2007
Measured by	Anni Manninen

14.1. 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.

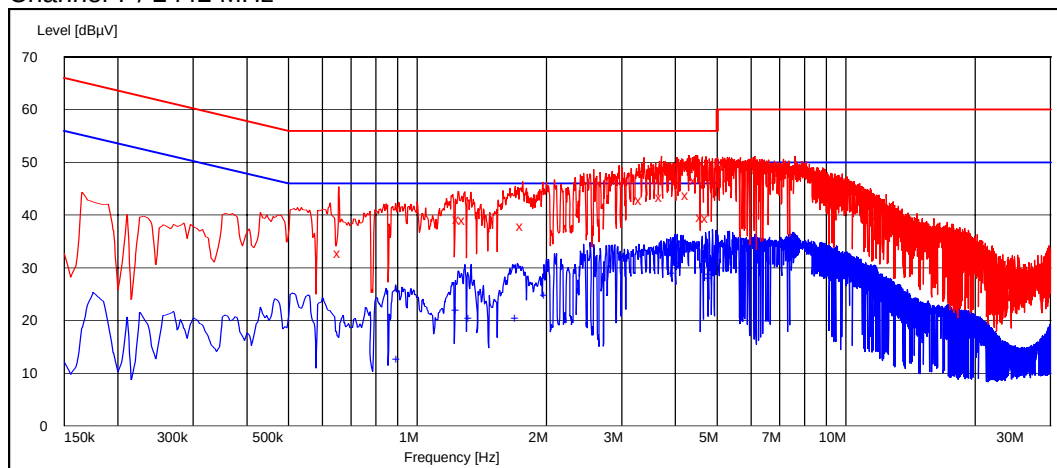
CISPR 22 Class B limits

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

14.2. WLAN Test results

14.2.1 DSSS mode, BPSK modulation, 1 Mbps data rate

Channel 7 / 2442 MHz

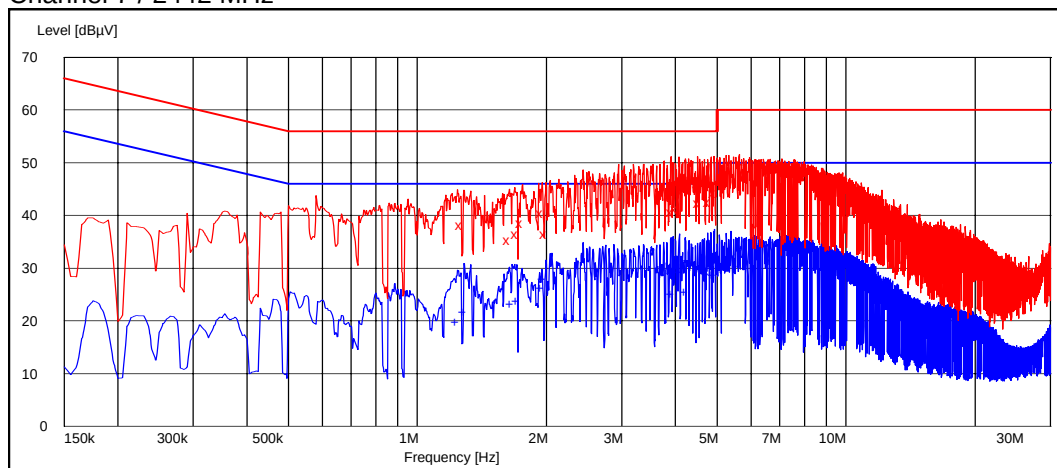


Frequency [MHz]	U [dBμV]	Line	Result
0.660000	32.80	N	PASSED
1.250000	39.20	N	PASSED
1.290000	39.00	N	PASSED
1.760000	37.90	N	PASSED
3.335000	42.80	N	PASSED
3.715000	43.50	N	PASSED
4.285000	43.70	N	PASSED
4.465000	46.70	N	PASSED
4.615000	39.60	L1	PASSED
4.755000	39.50	L1	PASSED

Frequency [MHz]	U [dBμV]	Line	Result
0.905000	12.60	N	PASSED
1.245000	21.90	N	PASSED
1.330000	20.50	N	PASSED
1.710000	20.40	N	PASSED
2.000000	24.80	N	PASSED
3.955000	28.90	N	PASSED
4.080000	30.80	N	PASSED
4.740000	31.30	N	PASSED
4.820000	28.10	L1	PASSED
4.870000	28.80	L1	PASSED
5.000000	30.30	L1	PASSED

14.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 7 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
1.270000	38.20	N	PASSED
1.640000	35.40	L1	PASSED
1.710000	36.50	L1	PASSED
1.755000	38.50	N	PASSED
1.955000	40.50	N	PASSED
1.995000	36.40	L1	PASSED
3.940000	40.70	N	PASSED
4.035000	41.20	N	PASSED
4.550000	42.40	N	PASSED
4.810000	42.60	N	PASSED
4.880000	46.30	N	PASSED
4.955000	44.20	N	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
1.240000	19.70	L1	PASSED
1.290000	21.70	L1	PASSED
1.665000	23.10	L1	PASSED
1.715000	23.80	N	PASSED
1.955000	26.20	N	PASSED
1.970000	28.00	N	PASSED
3.945000	25.20	N	PASSED
4.115000	29.20	N	PASSED
4.245000	25.40	N	PASSED
4.750000	28.80	N	PASSED
4.825000	30.00	N	PASSED
4.915000	28.70	N	PASSED

15. 6 dB bandwidth (FCC §15.247(a)(2), RSS-210 A8.2 (1))

EUT with DUT number	RM-313, DUT 12188
Accessories with DUT numbers	BP-6MT, DUT 12189; HS-23, DUT 12190; AC-5E, DUT 11998
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 100
Date of measurements	11.09.2007
Measured by	Anni Manninen

15.1. 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

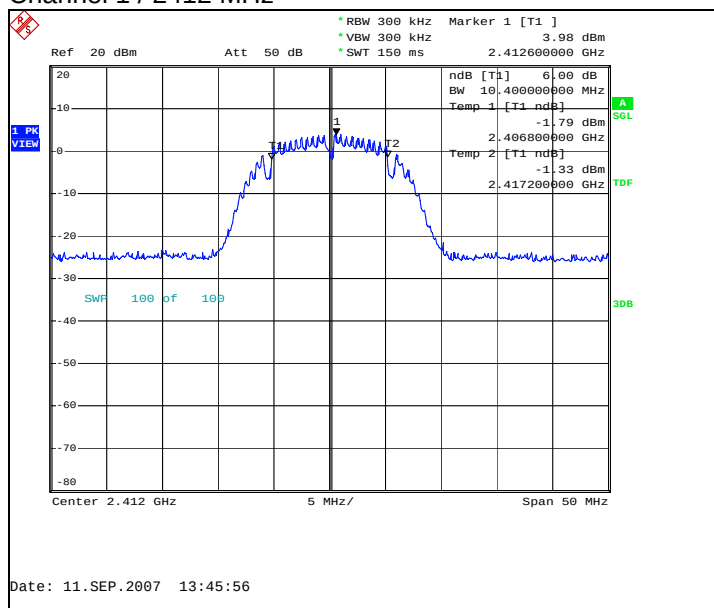
Limit [kHz]
≥ 500

15.2. WLAN test results

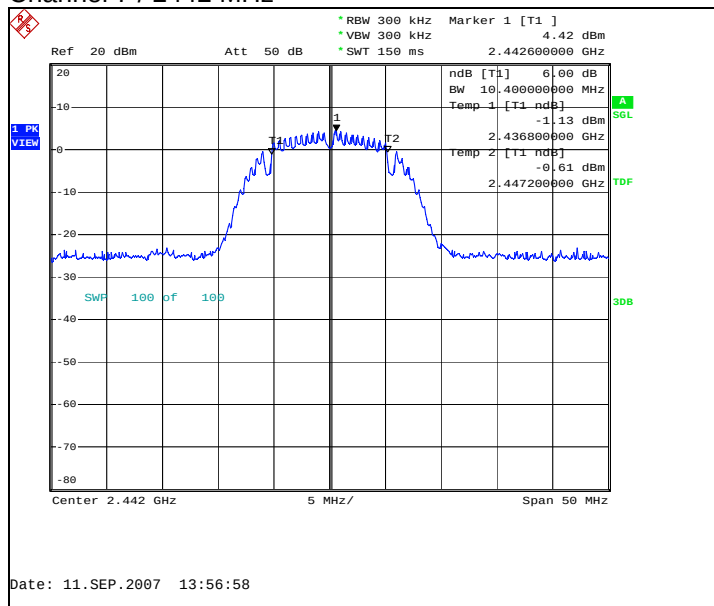
15.2.1 DSSS mode, BPSK modulation, 1 Mbps data rate

Channel / f_c [MHz]	6 dB bandwidth [kHz]	Result
1	10400.000	PASSED
7	10400.000	PASSED
11	10400.000	PASSED

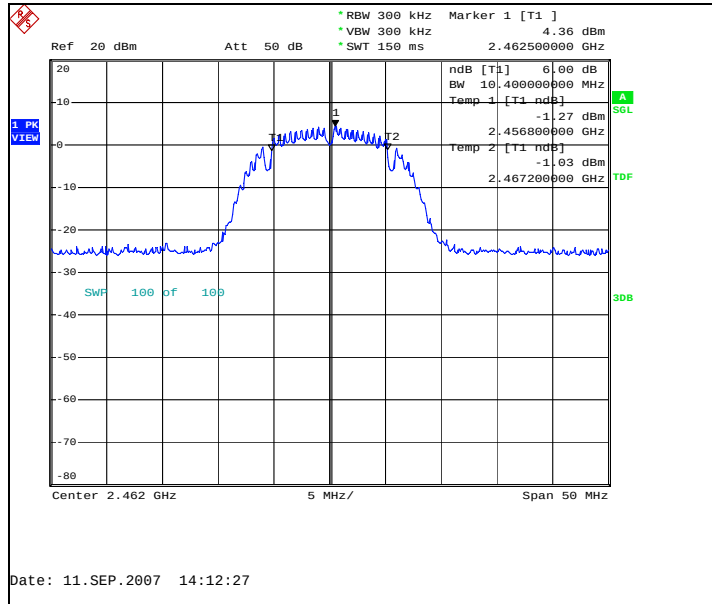
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



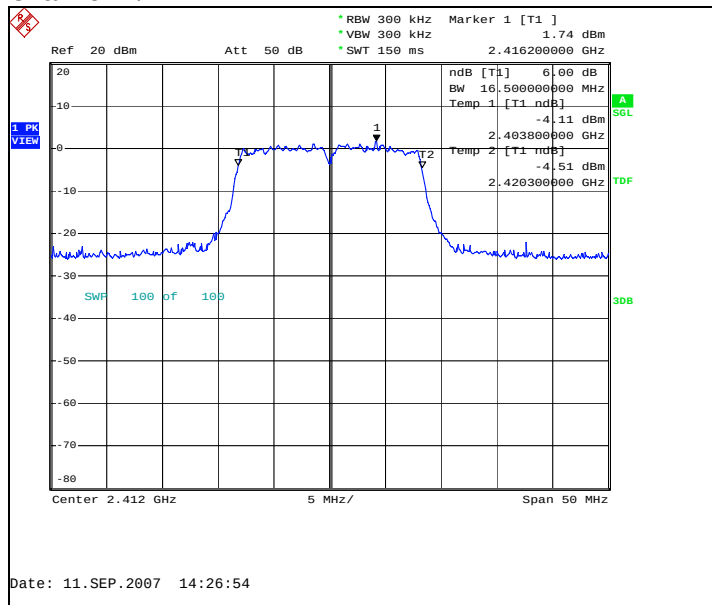
Channel 11 / 2462 MHz



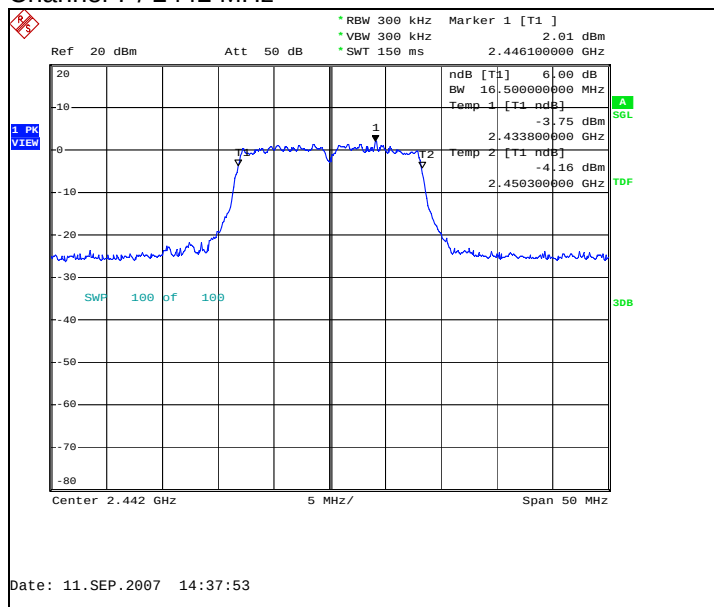
15.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f _c [MHz]	6 dB bandwidth [kHz]	Result
1	16500.000	PASSED
7	16500.000	PASSED
11	16500.000	PASSED

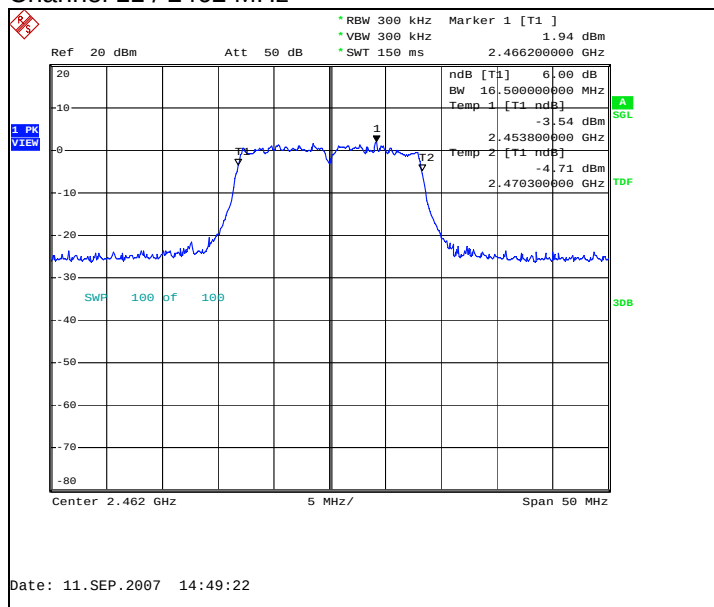
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



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

EUT with DUT number	RM-313, DUT 12188
Accessories with DUT numbers	BP-6MT, DUT 12189; HS-23, DUT 12190; AC-5E, DUT 11998
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 42 / 100
Date of measurements	11.09.2007
Measured by	Anni Manninen

16.1. 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

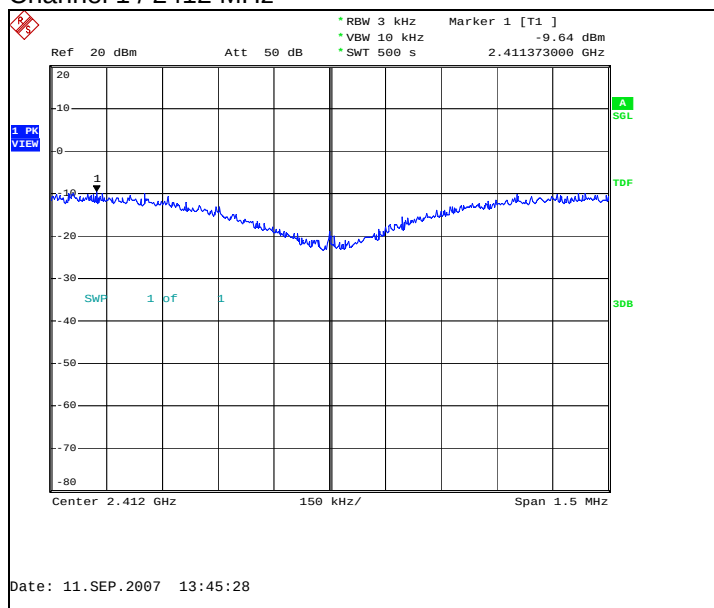
Limit [dBm] @ 3 kHz
≤ 8

16.2. WLAN test results

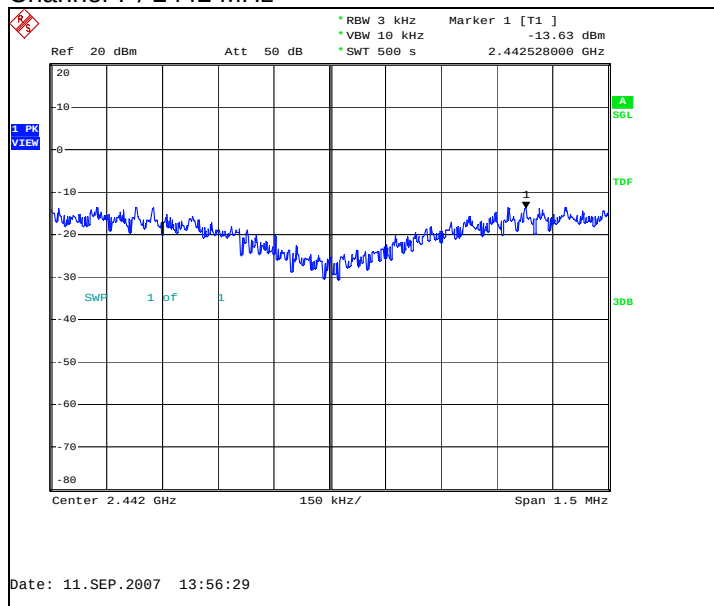
16.2.1 DSSS mode, BPSK modulation, 1 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-9.64	PASSED
7 / 2442	-13.63	PASSED
11 / 2462	-13.59	PASSED

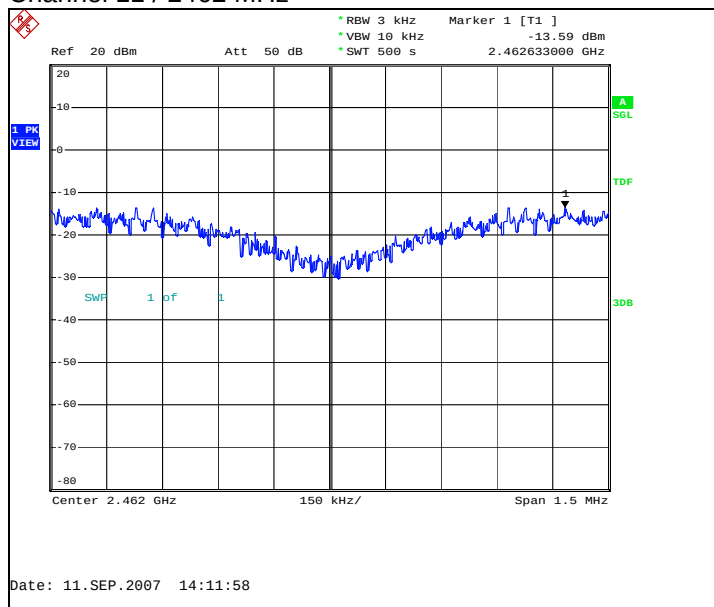
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



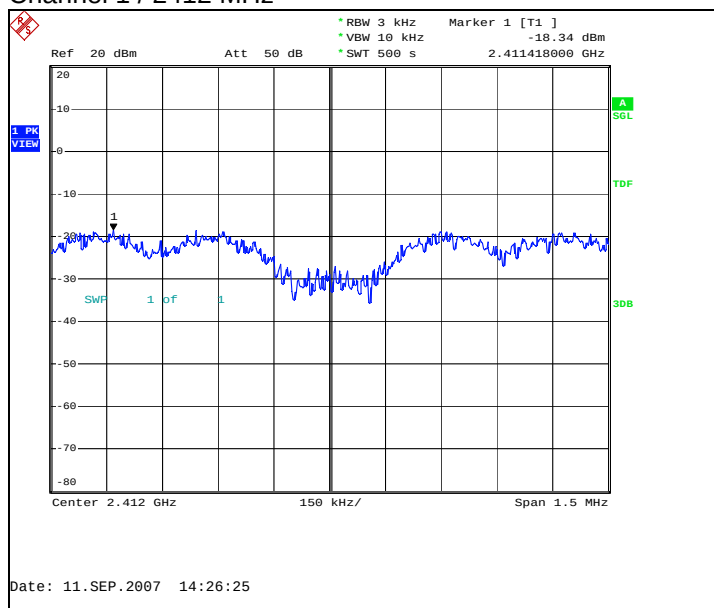
Channel 11 / 2462 MHz



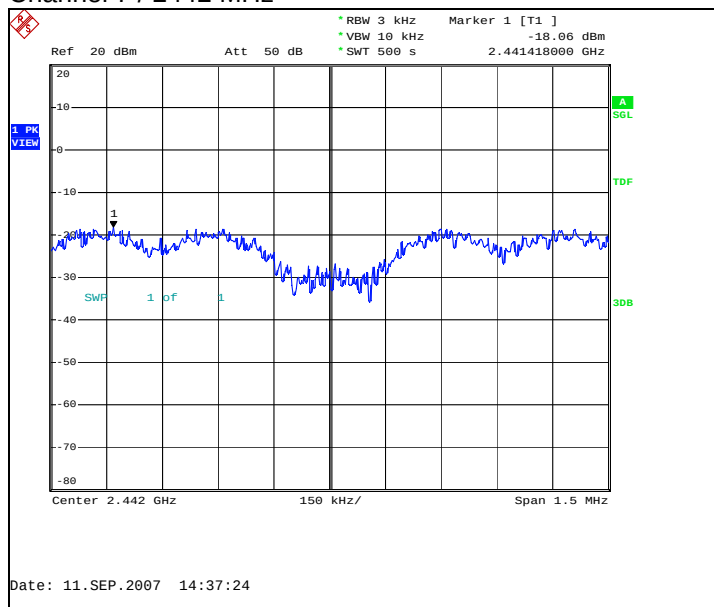
16.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-18.34	PASSED
7 / 2442	-18.06	PASSED
11 / 2462	-17.96	PASSED

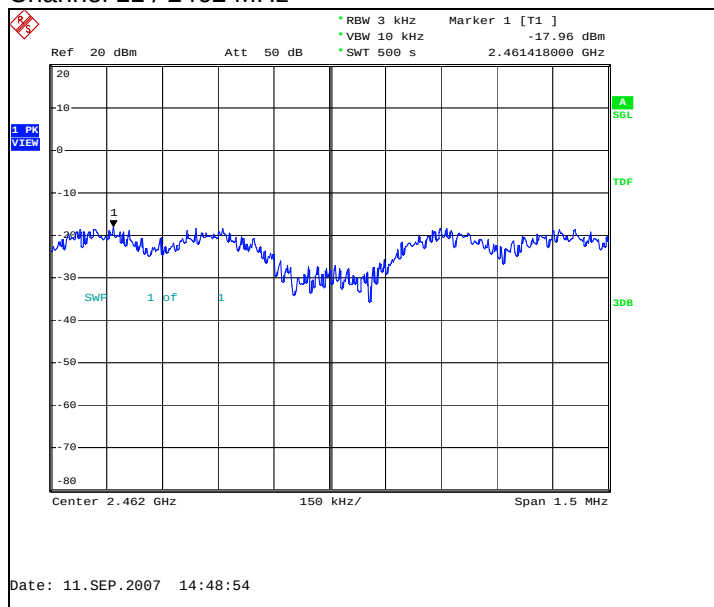
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



17. Test Equipment

17.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1742	EMI Test Receiver	ESMI	R&S	15C, 15B
1759	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
1872	Thermo- Hygrograph	00.02520.150700	Lambrecht	15C, 15B
1916	Radio Communication tester	CMTA84	R&S	15C, 15B
2039	Power Supply	PL330QMD	THURLBY	15C, 15B
2060	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
2068	CDN-Antenna line	S1	NMP	15C, 15B
2097	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
2111	Multimeter	TX3	Tektronix	15C, 15B
2156	Digital Radio Communication Tester	CMU200	R&S	15C, 15B
2206	Signal generator	SMX	R&S	15C, 15B
2335	GPIB Switch 2 to 1	-	National Instruments	15C, 15B
2347	Digital Radio Communication Tester	CMU200	R&S	22/24, 15C, 15B
2352	Spectrum Analyzer	FSP	R&S	22/24, 15C
2359	Temperature Test system	VT4002	Vötsch Industrietechnik	22/24
2360	Serial Bus Converter	Serial 488A	IO Tech	22/24
2362	Power Supply	NGPX 70/5	R&S	22/24
2388	Bluetooth Tester	CBT	R&S	15C, 15B
-	RF Emission Software	ES-K1 v.1.71	R&S	22/24, 15C, 15B

17.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1748	Log. per. Antenna	HL025	R&S	22/24, 15C
1749	Log. per. Antenna	HL025	R&S	22/24, 15C
1875	Thermo- Hygrograph	00.02520.150700	Lambrecht	22/24, 15C, 15B
1917	Radio Communication tester	CMTA84	R&S	22/24, 15C, 15B
1933	Precision half-wave dipole antennas	HZ-13	R&S	22/24, 15C
1938	Precision half-wave dipole antennas	HZ-12	R&S	22/24, 15C
2006	Radiation Reference Source	VSQ	MEB	22/24, 15C, 15B
2009	Signal generator	SMP 22	R&S	22/24, 15C, 15B
2019	Multimeter	34401A	HP	22/24, 15C, 15B
2027	Coupling and Decoupling Network	M2 (modified) DC1	MEB	22/24, 15C, 15B
2028	Coupling and Decoupling Network	M3 (modified) DC2	MEB	22/24, 15C, 15B
2029	Power Supply	PL330	THURLBY	22/24, 15C, 15B
2043	Band Reject Filter	WRCA824/849-0,2-6SS	Wainwright	22/24, 15C, 15B
2047	Band Reject Filter	WRCC1800/2000-0,2-10SS	Wainwright	22/24, 15C, 15B
2051	High Pass Filter	4HC1700-1-KK	R&S	22/24, 15C
2057	Log. per. Antenna	HL025	R&S	22/24, 15C

Eq. No	Equipment	Type	Manufacturer	Used in
2109	Power Supply	PL330QMD	THURLBY	22/24, 15C, 15B
2110	Multimeter	34401A	HP	22/24, 15C, 15B
2112	Multimeter	TX3	Tektronix	22/24, 15C, 15B
2116	Controller	EMCO MODEL 2090	ETS	22/24, 15C, 15B
2133	Power Meter	NRVS	R&S	22/24, 15C
2134	Power Sensor	NRV-Z32	R&S	22/24, 15C
2135	Coupling and Decoupling Network	CDN 801-M3	LÜTHI	22/24, 15C, 15B
2138	Ultra Broadband Antenna	HL562	R&S	22/24, 15C, 15B
2140	Biconical Antenna	EMCO93110B	EMCO	22/24, 15C
2142	Log.-per.-dipol Antenna	3146	EMCO	22/24, 15C
2144	Attenuator	6803.17B	Huber-Suhner	22/24, 15C, 15B
2150	High Pass Filter	F-15041	RLC ELECTRONICS	22/24, 15C
2176	Coupling and Decoupling Network	CDN 801-M3	LÜTHI	22/24, 15C, 15B
2180	Digital Radio Communication Tester	CMU200	R&S	22/24, 15C, 15B
2188	Preamplifier	AFS4-00100300-20-23P-6	MITEQ	22/24, 15C, 15B
2330	EMI Test receiver	ESIB26	R&S	22/24, 15C, 15B
2334	GPIB Switch 2 to 1	-	National Instruments	22/24, 15C, 15B
2348	Yaesu controller	G-1000DXC	YAESU	22/24, 15C, 15B
2349	Computer controller (Yaesu)	GS-232B	YAESU	22/24, 15C, 15B
2350	Preamplifier	AMF-6D-020180-29-20P	MITEQ	22/24, 15C
2361	Anechoic chamber	3 meter semi/full anechoic chamber	Euroshield	22/24, 15C, 15B
2398	Horn antenna	HF906	R&S	22/24, 15C
2363	Band Reject Filter	WRCG 832/838-825/845/5SS	Wainwright	22/24
2364	Band Reject Filter	WRCG1877/1883 - 1870/1890-40/6SS	Wainwright	22/24
2365	Relay Switch Unit	TS-RSP	R&S	22/24, 15C, 15B
2366	Relay Switch Unit	TS-RSP	R&S	22/24, 15C, 15B
2384	Band Reject Filter	WRCG832/838-825/845-40/5SS	Wainwright	22/24
2388	Bluetooth Tester	CBT	R&S	15C, 15B
-	RF Emission Software	ES-K1 v.1.71	R&S	22/24, 15C, 15B