

FCC Part 15C Compliance Test Report

Test Report no.:	Tre_FCC_0837_01.doc	Date of Report:	08-Sep-2008
Number of pages:	71	Customer's Contact person:	Stephen Walmsley
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FCC listing no.:	533467		
IC recognition no.:	661V-1		
Tested devices/ accessories:	Phone RM-472 / Battery BL-5F, Audio Adapter AD-54, Headset HS-45 and AC-Charger AC-5E		
FCC ID:	QEYRM-472	IC:	661L-RM472
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:			

Jari Jantunen, Test System Manager

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	28-Mar-2008
Testing completed	10-Apr-2008
The customer's contact person	Stephen Walmsley
Test Plan referred to	T:\Projects\RM-247\TestPlan_RS\RS_Testplan_RM-247.xls
Notes	
Document name	T:\Projects\RM-247\EMC\Results\FCC\Salo_FCC_0814_05.doc

1.1. EUT and Accessory Information

The EUT is a 6-band (GSM850/900/1800/1900 and WCDMA Band II/V) 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-247	004401018149258	0510_A	-	V0.0810.0.0.019	12708
Phone	RM-247	004401018148284	0510_A	-	V0.0810.0.0.019	12812
Battery	BL-5F	3635637363520601840;0670498	-	-	-	12813
Audio Adapter	AD-54	07508387352J2108137	-	-	-	12704
Headset	HS-45	-	-	-	-	12705
AC-Charger	AC-5E	3943497117090624005;0675540	-	-	-	12814
Phone	RM-247	004401018148391	0510_A	-	V0.0810.0.0.019	12648
Battery	BL-5F	000008025140100013;0670498	-	-	-	12633
Audio adapter	AD-54	07508387295J100116	0.6	1.7	-	12436
Headset	HS-45	06942357301K1900958	2	0.5	-	12435
AC-Charger	AC-5E	3820667325270111862;0670523;	1.9	1.9	-	12613

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

The test results of QEYRM-247 are re-used for certification of the QEYRM-472. The table above indicates the results, which will be re-used.

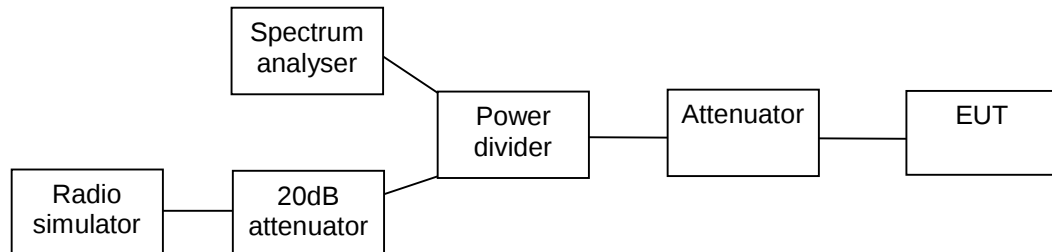
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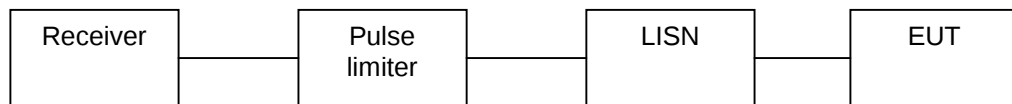
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2. Test setups

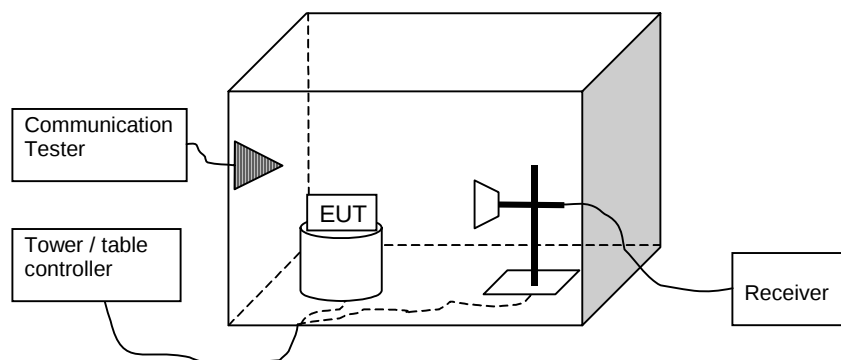
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Radiated test setup



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

EUT with DUT number	RM-247, DUT 12708
Accessories with DUT numbers	BL-5F, DUT 12813; AD-54, DUT 12704; HS-45, DUT 12705; AC-5E, DUT 12814
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 41 / 101
Date of measurements	03-Apr-2008
Measured by	Anni Manninen / Jouko Kaivonen

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

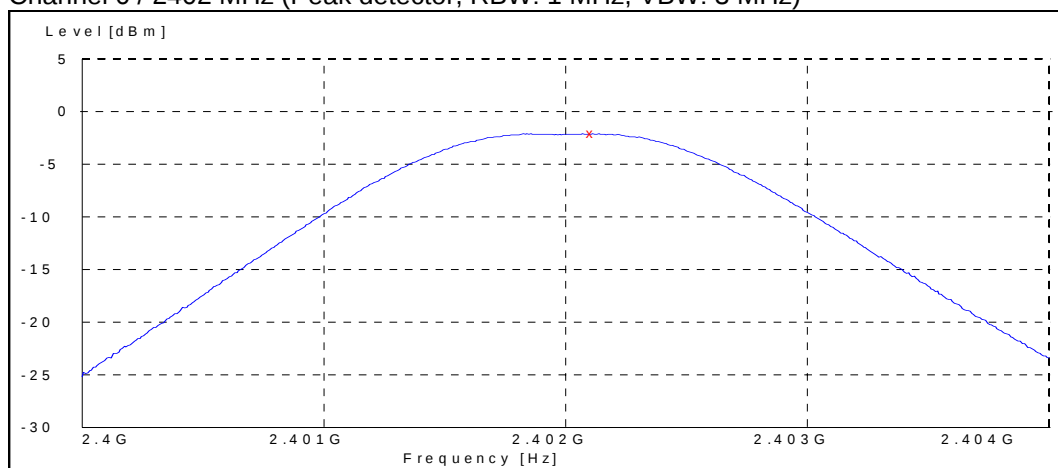
Frequency range [MHz]	Limit [W]	Limit [dBm]
2400 – 2483.5	≤ 1	≤ 30

3.2. Bluetooth Test results

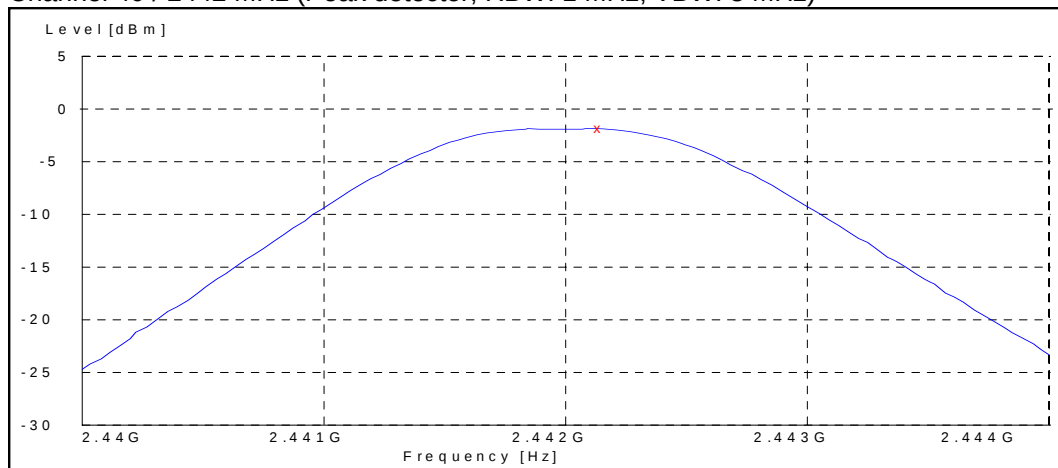
3.2.1 GFSK modulation, PRBS packet type

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
0 / 2402	-2.10	0.617	PASSED
40 / 2442	-1.80	0.661	PASSED
78 / 2480	-1.40	0.724	PASSED

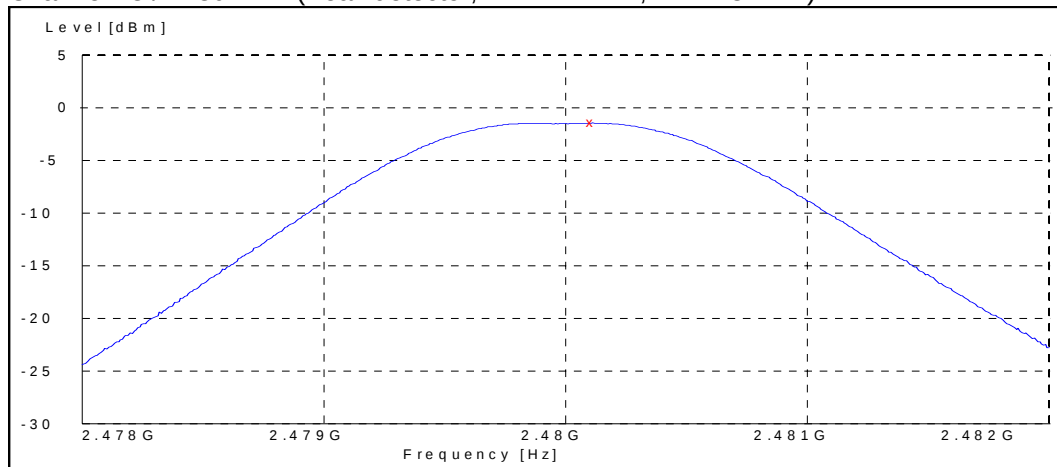
Channel 0 / 2402 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



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



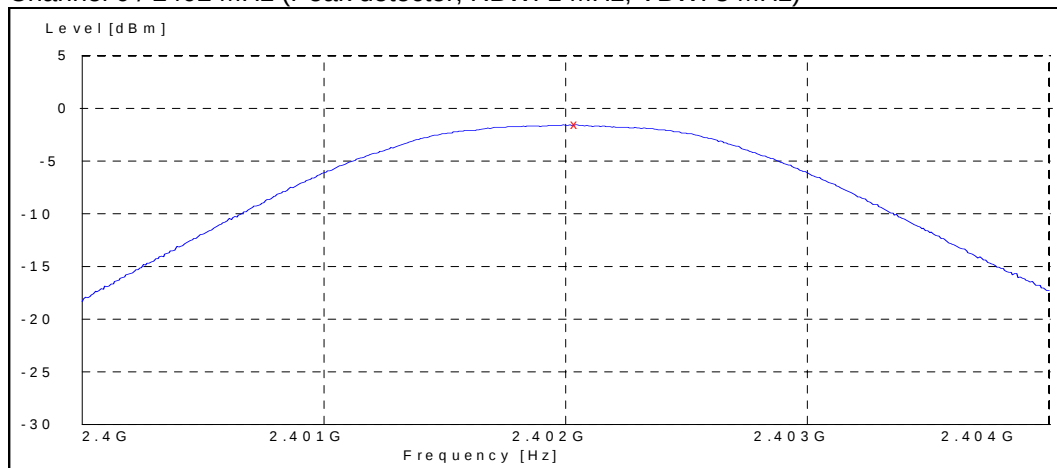
Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



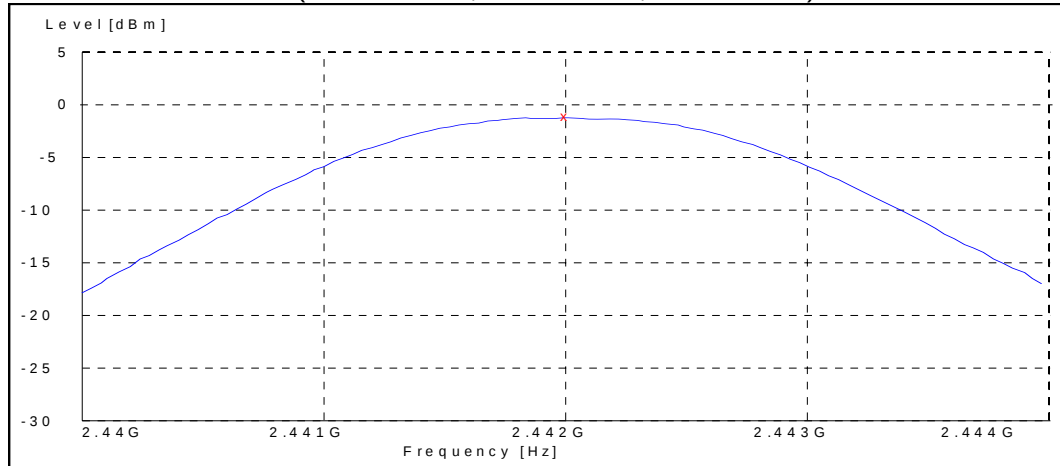
3.2.2 8DPSK modulation, PRBS packet type

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
0 / 2402	-1.50	0.708	PASSED
40 / 2442	-1.10	0.776	PASSED
78 / 2480	-0.50	0.891	PASSED

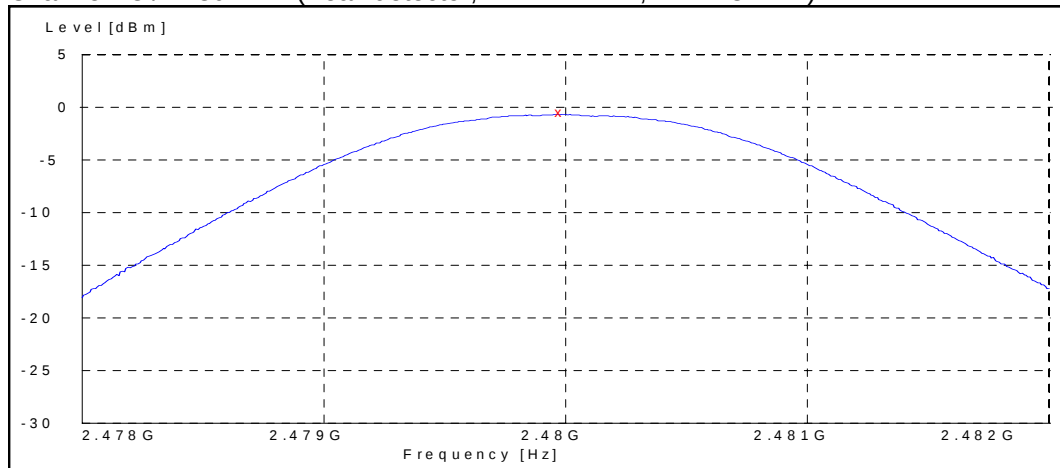
Channel 0 / 2402 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



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(d), RSS-210 A8.5)

EUT with DUT number	RM-247, DUT 12648
Accessories with DUT numbers	BL-5F, DUT 12633; AD-54, DUT 12436; HS-45, DUT 12435; AC-5E, DUT 12613
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Phone measured all slide positions.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	18 / 42 / 103.2
Date of measurements	04-Apr-2008
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.

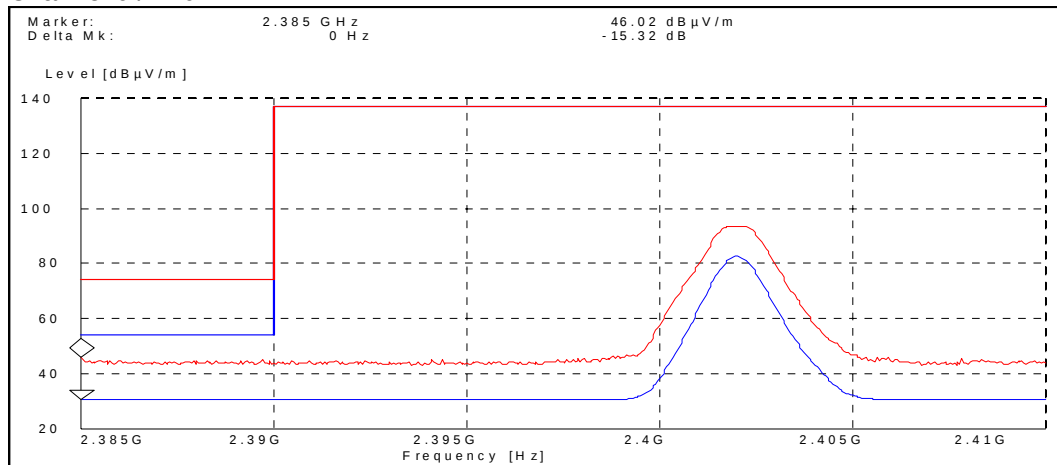
Limits for band edge compliance of RF emissions measurements (3 m measurement distance)

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

4.2. Bluetooth Test results

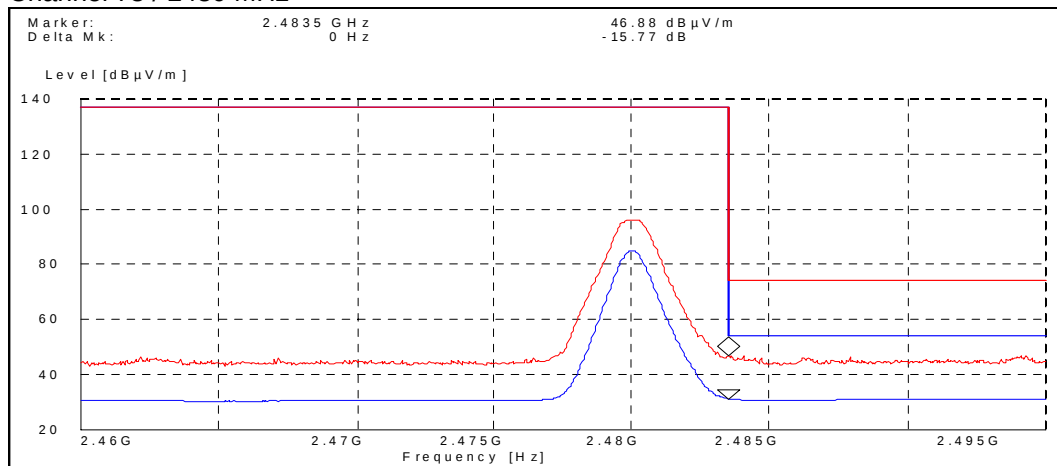
4.2.1 GFSK modulation, PRBS packet type

Channel 0 / 2402 MHz



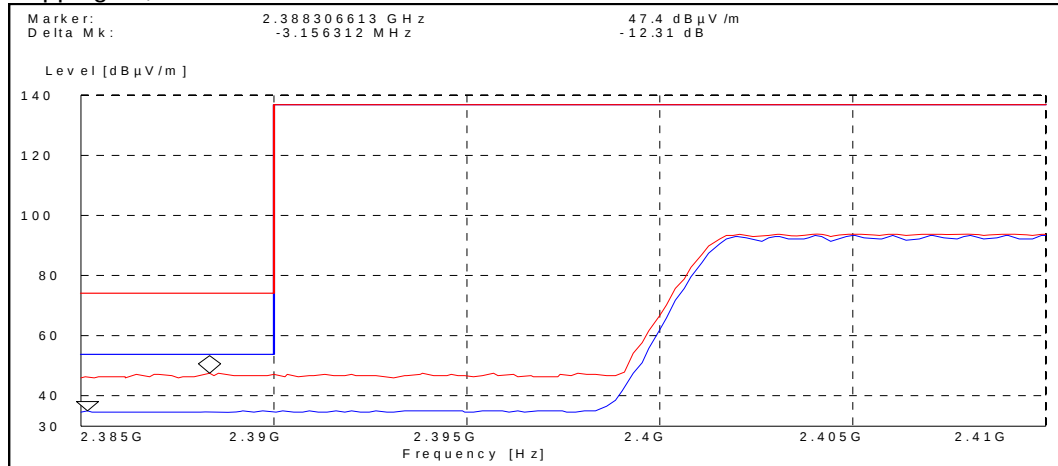
Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	46.00	PASSED
Average	30.70	PASSED

Channel 78 / 2480 MHz



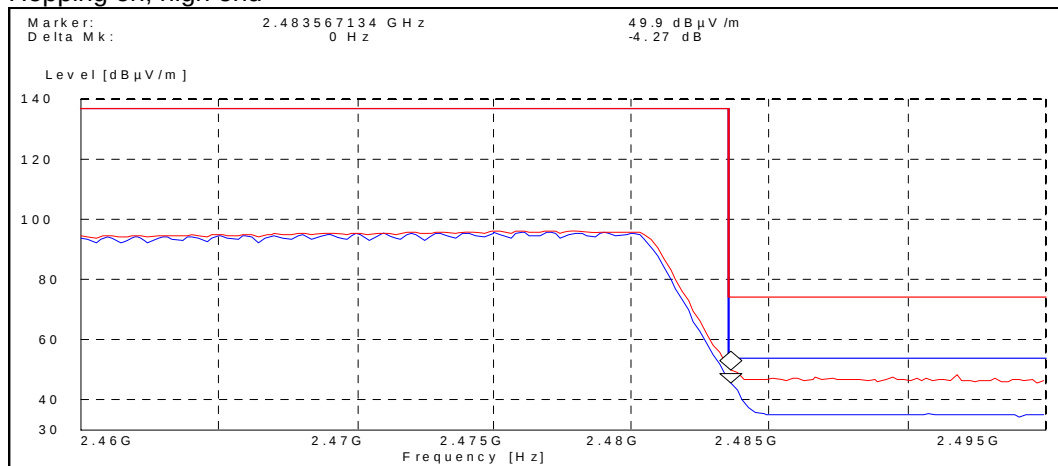
Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	46.90	PASSED
Average	31.10	PASSED

Hopping on, low end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	47.40	PASSED
Average	35.10	PASSED

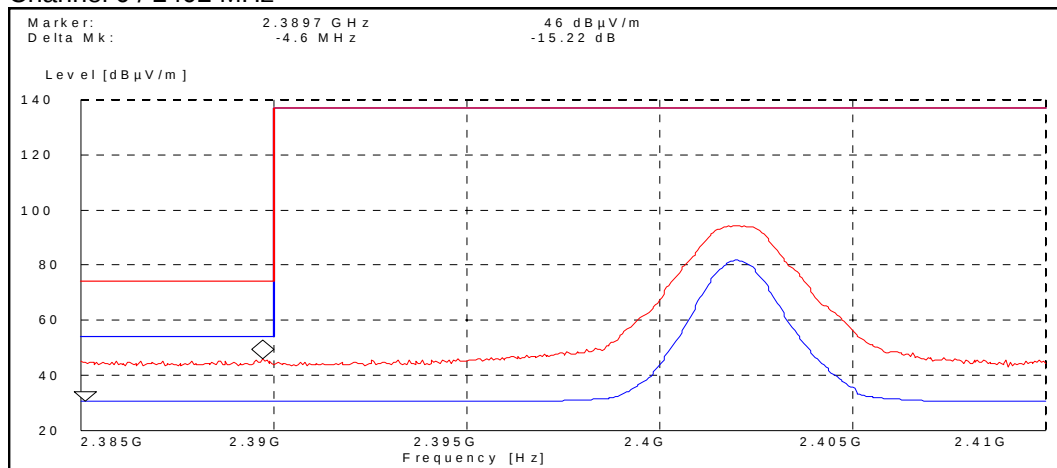
Hopping on, high end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	49.90	PASSED
Average	45.60	PASSED

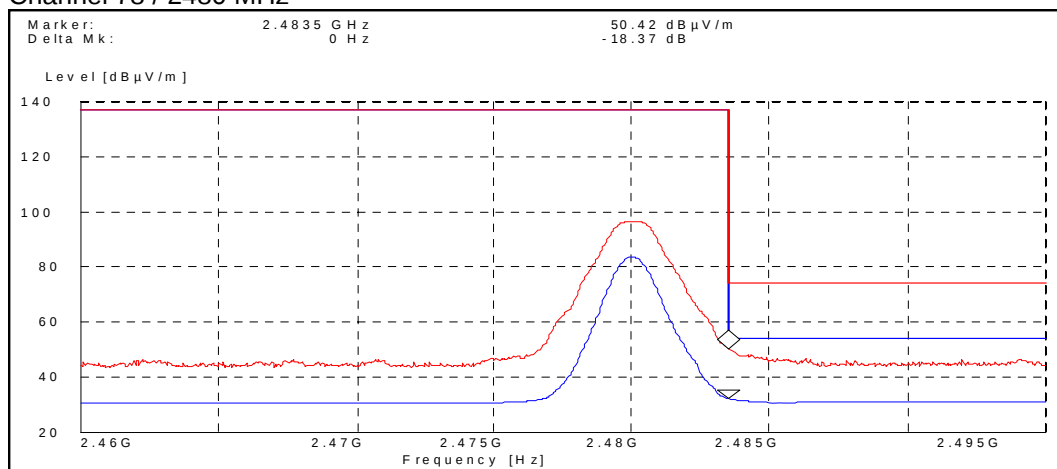
4.2.2 8DPSK modulation, PRBS packet type

Channel 0 / 2402 MHz



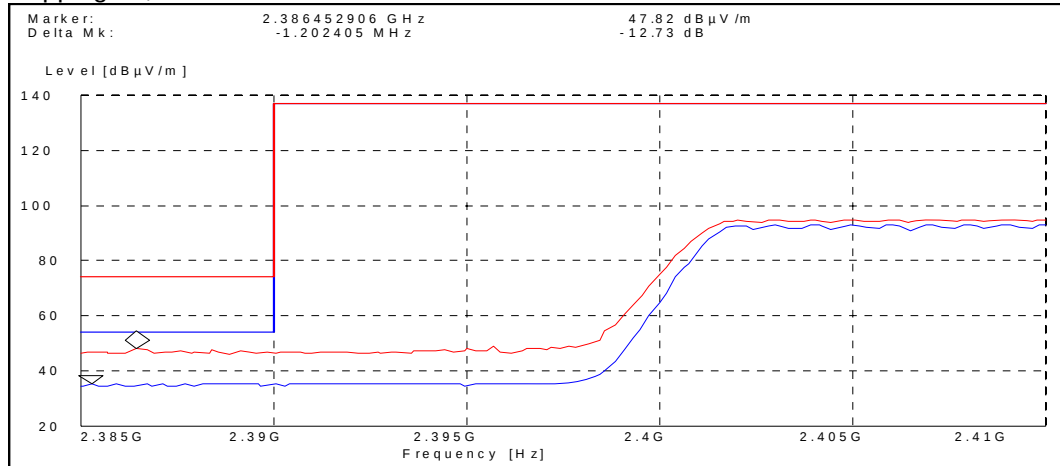
Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	46.00	PASSED
Average	30.80	PASSED

Channel 78 / 2480 MHz



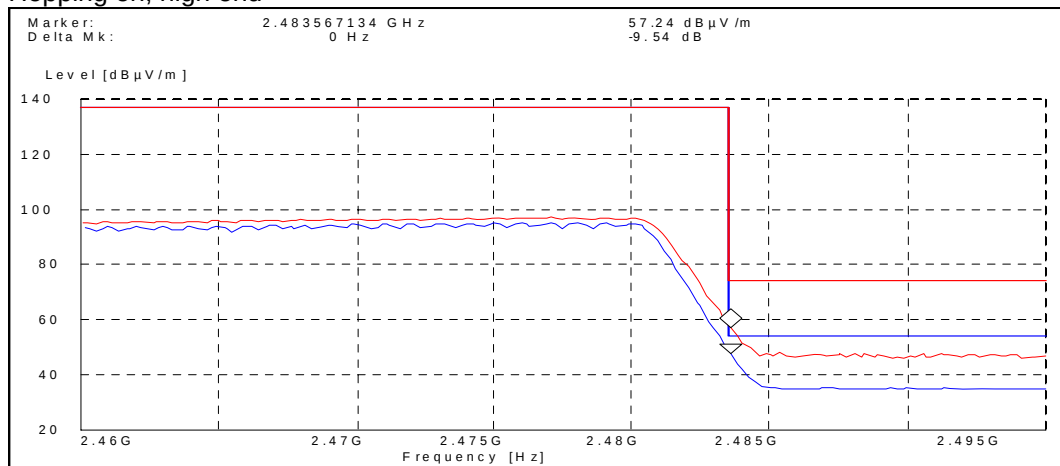
Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	50.40	PASSED
Average	32.00	PASSED

Hopping on, low end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	47.80	PASSED
Average	35.10	PASSED

Hopping on, high end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	57.20	PASSED
Average	47.70	PASSED

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

EUT with DUT number	RM-247, DUT 12708
Accessories with DUT numbers	BL-5F, DUT 12813; AD-54, DUT 12704; HS-45, DUT 12705; AC-5E, DUT 12814
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 41 / 101
Date of measurements	03-Apr-2008
Measured by	Anni Manninen / Jouko Kaivonen

5.1. Test method and limit

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

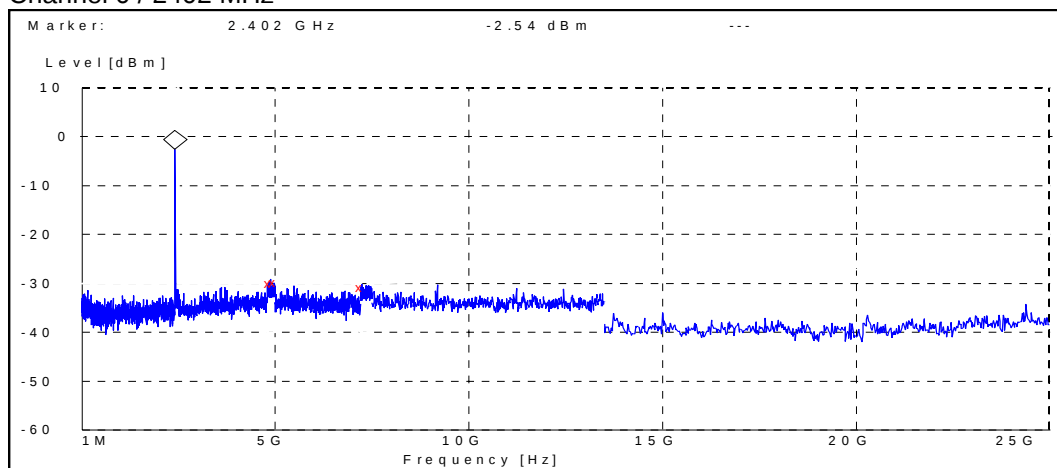
Limits for spurious RF conducted emissions measurements

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

5.2. Bluetooth Test results

5.2.1 GFSK modulation, PRBS packet type

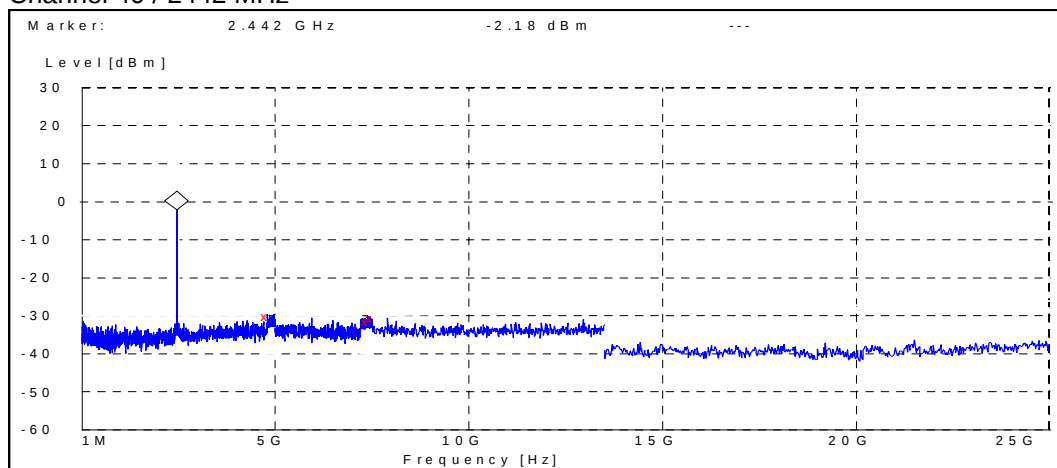
Channel 0 / 2402 MHz



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

Frequency [MHz]	P [dBc]	Result
4868.400000	-27.461235	PASSED
5000.000000	-27.161235	PASSED
7242.600000	-28.261235	PASSED

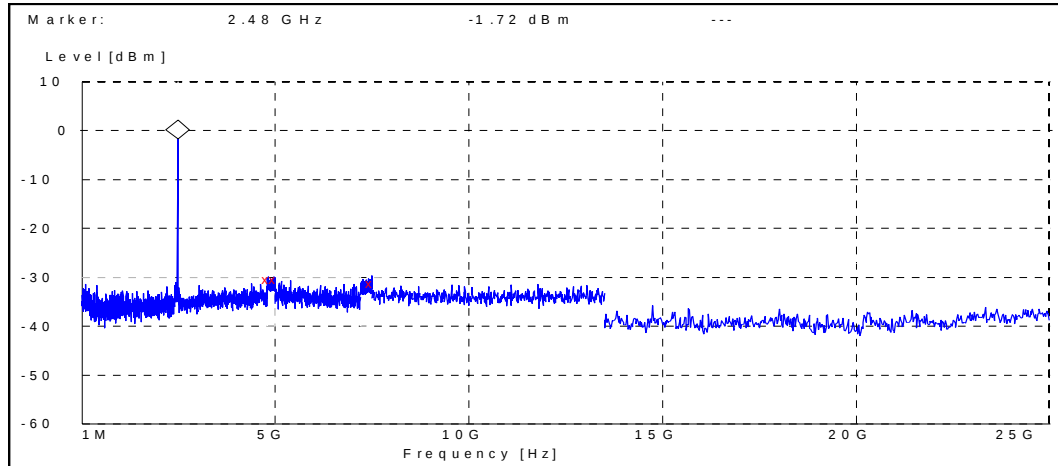
Channel 40 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4802.000000	-28.122313	PASSED
7387.800000	-29.122313	PASSED
7500.000000	-28.322313	PASSED

Channel 78 / 2480 MHz

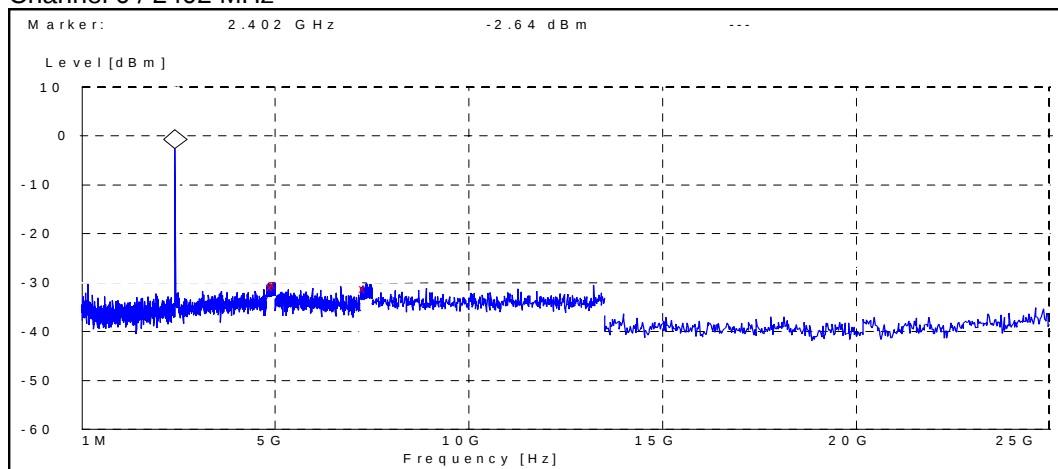


Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4806.000000	-28.675845	PASSED
5000.000000	-28.675845	PASSED
7491.000000	-29.575845	PASSED

5.2.2 8DPSK modulation, PRBS packet type

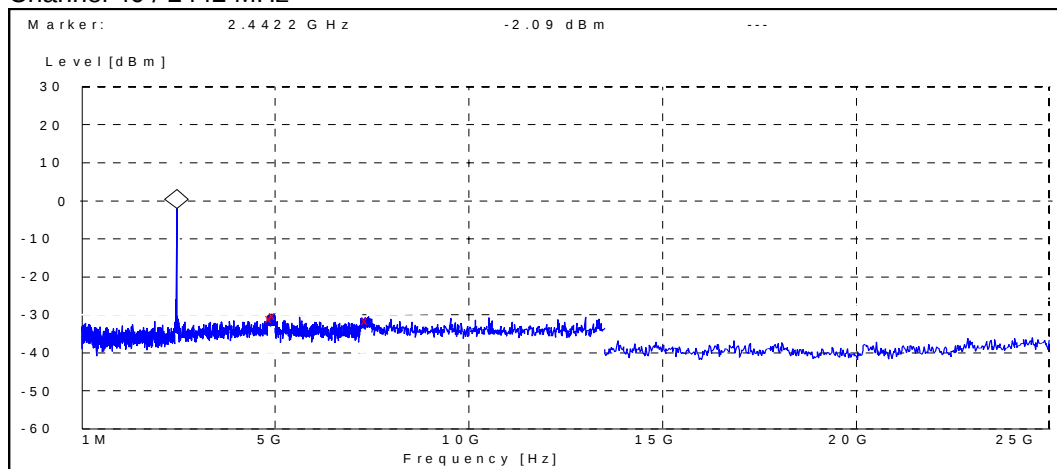
Channel 0 / 2402 MHz



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

Frequency [MHz]	P [dBc]	Result
4944.000000	-28.255591	PASSED
5000.000000	-27.755591	PASSED
7336.800000	-28.555591	PASSED

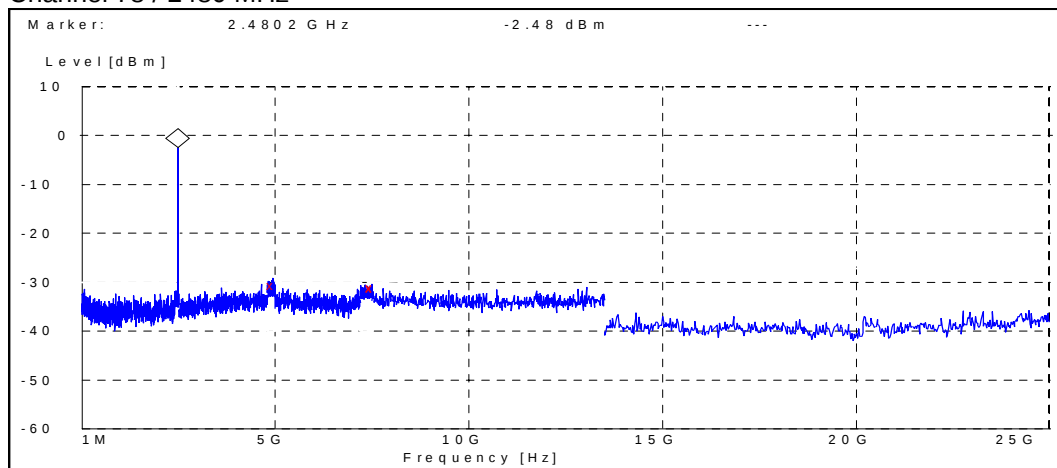
Channel 40 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4904.400000	-28.907350	PASSED
5000.000000	-28.007350	PASSED
7393.800000	-29.307350	PASSED

Channel 78 / 2480 MHz



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

Frequency [MHz]	P [dBc]	Result
4938.000000	-28.118289	PASSED
7486.200000	-28.818289	PASSED
7500.000000	-28.618289	PASSED

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

EUT with DUT number	RM-247, DUT 12648
Accessories with DUT numbers	BL-5F, DUT 12633; AD-54, DUT 12436; HS-45, DUT 12435; AC-5E, DUT 12613
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Phone tested slide open mode. Low and high channel harmonics measurements slide closed mode
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 42 / 102.3
Date of measurements	01-Apr-2008 – 02-Apr-2008
Measured by	Sami Lehtonen

6.1. Test method and limit

The measurement is made according to Public notice DA 00-705 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 [$\mu\text{V/m}$]	Limit [dB $\mu\text{V/m}$]	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. Bluetooth Test results

6.2.1 GFSK modulation, PRBS packet type

Channel 0 / 2402 MHz

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

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	43.50	149.62	43.30	0.2	VERTICAL	PASSED
7206.000000	46.30	206.54	44.10	2.2	VERTICAL	PASSED

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

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	30.30	32.73	30.10	0.2	VERTICAL	PASSED
7206.000000	33.00	44.67	30.80	2.2	VERTICAL	PASSED

Channel 40 / 2442 MHz

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

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
37.595391	21.80	12.30	42.00	-20.2	VERTICAL	PASSED
114.508818	14.70	5.43	41.00	-26.3	HORIZONTAL	PASSED

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

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
4824.147295	43.20	144.54	42.70	0.5	VERTICAL	PASSED
12516.024048	53.00	446.68	42.50	10.5	VERTICAL	PASSED
13367.227455	54.20	512.86	40.80	13.4	VERTICAL	PASSED
15399.797595	52.50	421.70	37.10	15.4	VERTICAL	PASSED
15901.307615	54.50	530.88	37.60	16.9	VERTICAL	PASSED
16194.384770	55.40	588.84	37.90	17.5	VERTICAL	PASSED
17921.343687	56.40	660.69	37.40	19.0	VERTICAL	PASSED

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

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
4823.147295	30.10	31.99	29.60	0.5	VERTICAL	PASSED
12513.524048	39.40	93.33	28.90	10.5	VERTICAL	PASSED
13366.227455	40.70	108.39	27.30	13.4	VERTICAL	PASSED
15399.797595	40.00	100.00	24.60	15.4	VERTICAL	PASSED

15905.307615	41.50	118.85	24.70	16.8	VERTICAL	PASSED
16190.384770	42.20	128.82	24.80	17.4	VERTICAL	PASSED
17924.343687	43.90	156.68	24.80	19.1	VERTICAL	PASSED

Channel 78 / 2480 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	44.20	162.18	44.60	-0.4	HORIZONTAL	PASSED
7440.000000	46.50	211.35	43.40	3.1	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	30.00	31.62	30.40	-0.4	VERTICAL	PASSED
7440.000000	34.00	50.12	30.90	3.1	VERTICAL	PASSED

6.2.2 8DPSK modulation, PRBS packet type

Channel 0 / 2402 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	43.80	154.88	43.60	0.2	VERTICAL	PASSED
7206.000000	46.00	199.53	43.80	2.2	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	31.00	35.48	30.80	0.2	HORIZONTAL	PASSED
7206.000000	33.10	45.19	30.90	2.2	VERTICAL	PASSED

Channel 40 / 2442 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
37.695391	11.20	3.63	31.40	-20.2	HORIZONTAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4883.269539	43.50	149.62	42.90	0.6	VERTICAL	PASSED
12483.465932	52.40	416.87	41.70	10.7	VERTICAL	PASSED
13278.061122	53.40	467.74	40.80	12.6	VERTICAL	PASSED
15474.441884	52.50	421.70	37.40	15.1	VERTICAL	PASSED
15868.733467	54.90	555.90	38.50	16.4	VERTICAL	PASSED
16195.390782	55.00	562.34	37.50	17.5	VERTICAL	PASSED
17921.847695	57.20	724.44	38.20	19.0	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4883.269539	30.60	33.88	30.00	0.6	VERTICAL	PASSED
12480.965932	39.60	95.50	28.90	10.7	VERTICAL	PASSED
13282.061122	40.50	105.93	27.90	12.6	VERTICAL	PASSED
15472.441884	39.90	98.86	24.80	15.1	VERTICAL	PASSED
15869.733467	41.50	118.85	25.10	16.4	VERTICAL	PASSED
16199.390782	42.20	128.82	24.60	17.6	VERTICAL	PASSED
17924.347695	43.90	156.68	24.80	19.1	VERTICAL	PASSED

Channel 78 / 2480 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	42.40	131.83	42.80	-0.4	HORIZONTAL	PASSED
7440.000000	47.30	231.74	44.20	3.1	HORIZONTAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	30.30	32.73	30.70	-0.4	VERTICAL	PASSED
7440.000000	34.00	50.12	30.90	3.1	VERTICAL	PASSED

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

EUT with DUT number	RM-247, DUT 12812
Accessories with DUT numbers	BL-5F, DUT 12813; AD-54, DUT 12704; HS-45, DUT 12705; AC-5E, DUT 12814
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 41 / 101
Date of measurements	03-Apr-2008
Measured by	Anni Manninen / Jouko Kaivonen

7.1. 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.

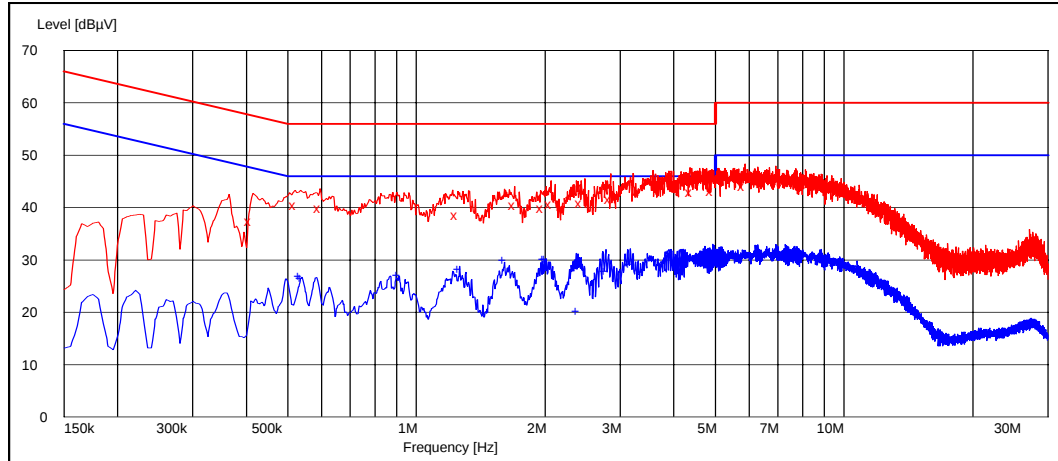
CISPR 22 Class B limits

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

7.2. Bluetooth Test results

7.2.1 GFSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

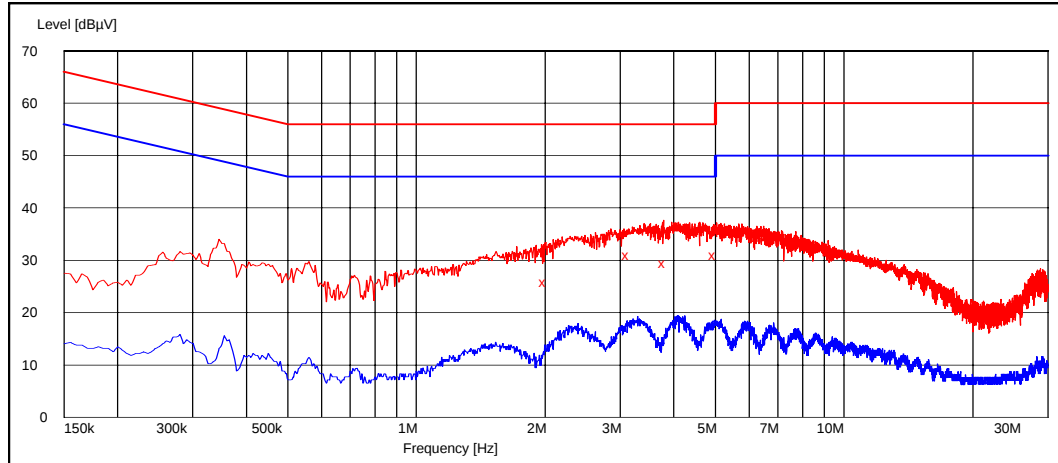
Frequency [MHz]	U [dBμV]	Line	Result
0.410000	37.50	L1	PASSED
0.520000	40.50	L1	PASSED
0.595000	39.90	L1	PASSED
1.245000	38.50	L1	PASSED
1.695000	40.50	L1	PASSED
1.970000	39.90	L1	PASSED
2.065000	40.70	L1	PASSED
2.430000	40.90	L1	PASSED
2.845000	41.60	L1	PASSED
4.405000	42.90	L1	PASSED
4.915000	43.10	L1	PASSED
5.830000	44.10	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.535000	26.80	L1	PASSED
0.540000	26.50	L1	PASSED
0.910000	27.10	L1	PASSED
1.260000	28.20	L1	PASSED
1.605000	29.90	L1	PASSED
1.995000	30.10	L1	PASSED
2.015000	30.20	L1	PASSED
2.385000	20.20	L1	PASSED
2.775000	27.90	L1	PASSED
3.165000	29.20	L1	PASSED
4.770000	29.50	L1	PASSED
4.975000	28.90	L1	PASSED

7.2.2 8DPSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
2.000000	25.90	L1	PASSED
3.125000	31.00	L1	PASSED
3.810000	29.50	L1	PASSED
4.995000	31.00	L1	PASSED

8. 20 dB bandwidth (FCC §15.247(a)(1), RSS-210 A8.1 (1))

EUT with DUT number	RM-247, DUT 12708
Accessories with DUT numbers	BL-5F, DUT 12813; AD-54, DUT 12704; HS-45, DUT 12705; AC-5E, DUT 12814
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 41 / 101
Date of measurements	03-Apr-2008
Measured by	Anni Manninen / Jouko Kaivonen

8.1. 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

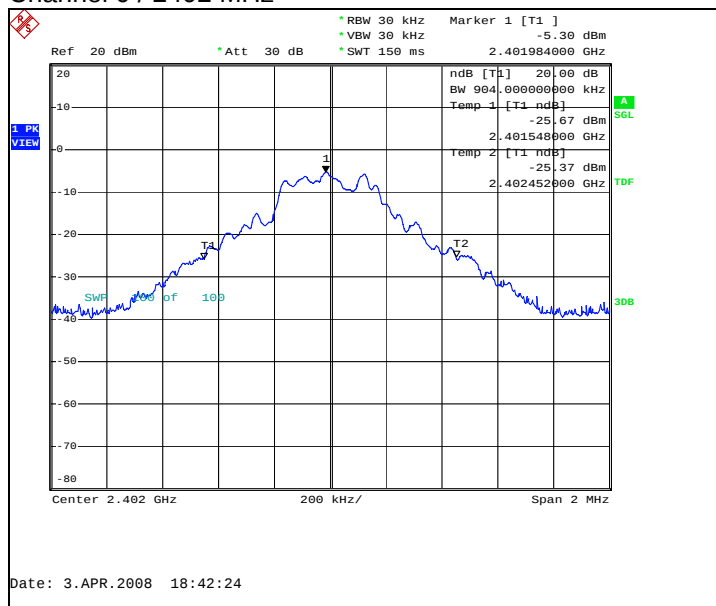
Limit [MHz]
N/A

8.2. Bluetooth Test results

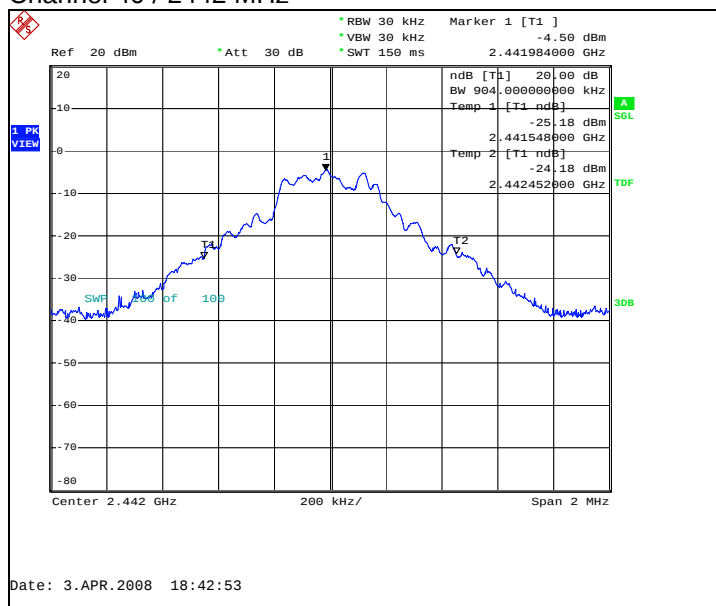
8.2.1 GFSK modulation, PRBS packet type

Channel / f_c [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	904.000	PASSED
40 / 2442	904.000	PASSED
78 / 2480	916.000	PASSED

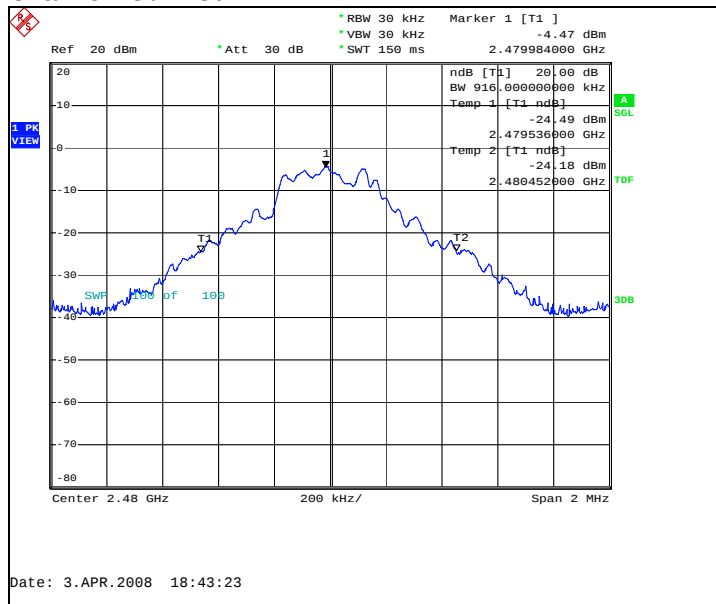
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



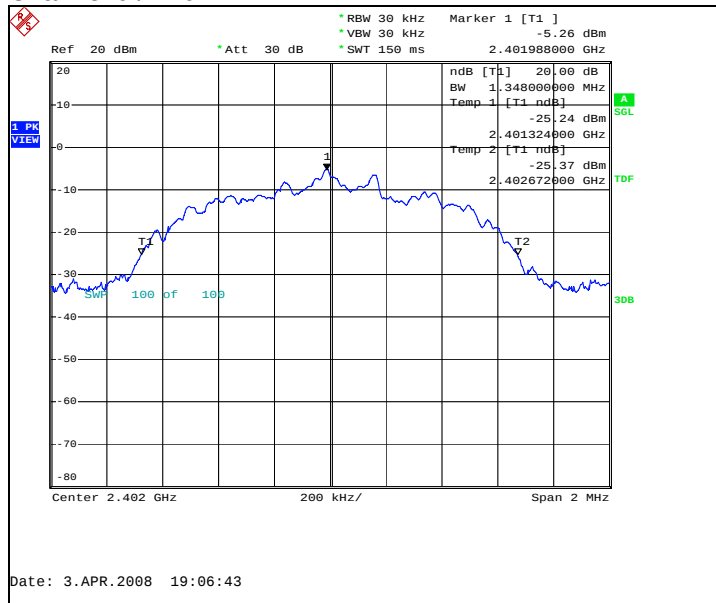
Channel 78 / 2480 MHz



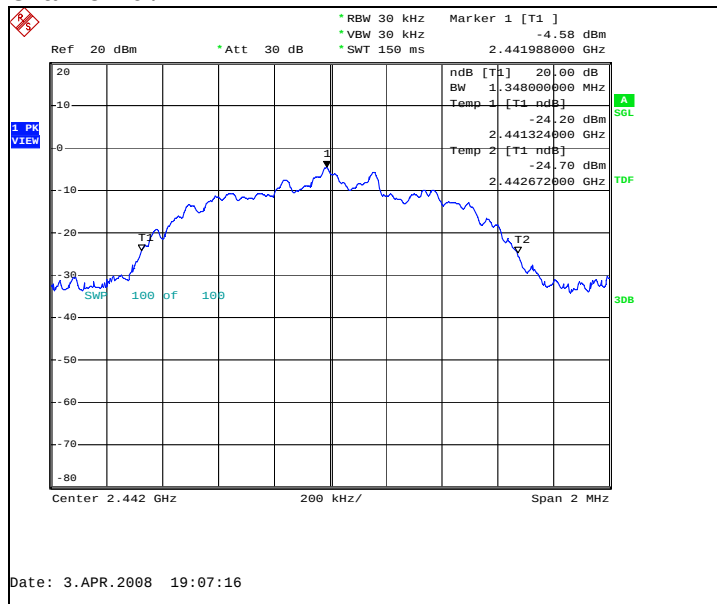
8.2.2 8DPSK modulation, PRBS packet type

Channel / f _c [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	1348.000	PASSED
40 / 2442	1348.000	PASSED
78 / 2480	1348.000	PASSED

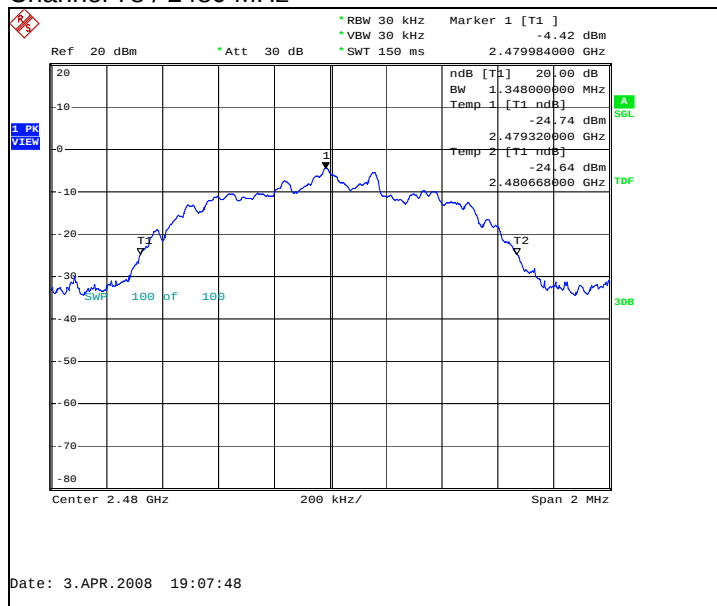
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



Channel 78 / 2480 MHz



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

EUT with DUT number	RM-247, DUT 12708
Accessories with DUT numbers	BL-5F, DUT 12813; AD-54, DUT 12704; HS-45, DUT 12705; AC-5E, DUT 12814
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 41 / 101
Date of measurements	03-Apr-2008
Measured by	Anni Manninen / Jouko Kaivonen

9.1. 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

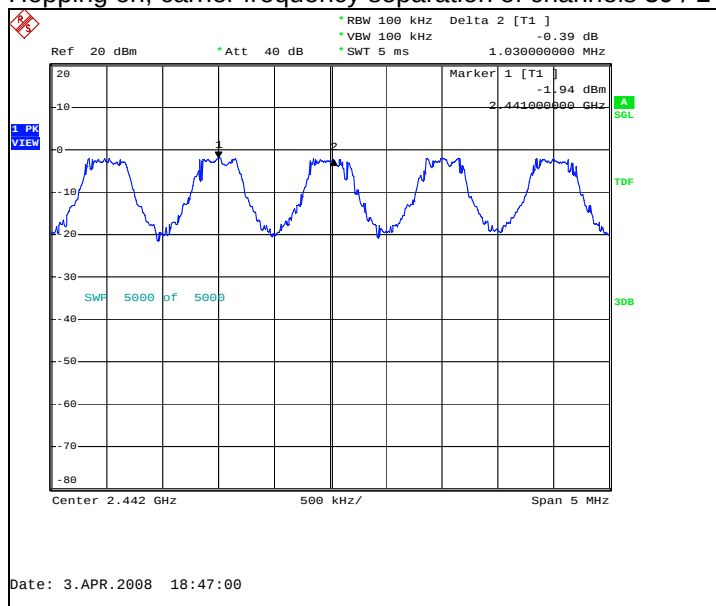
Limit [MHz]
≥ 0.025 or $2/3$ of the 20 dB bandwidth

9.2. Bluetooth Test results

9.2.1 GFSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
1030	PASSED

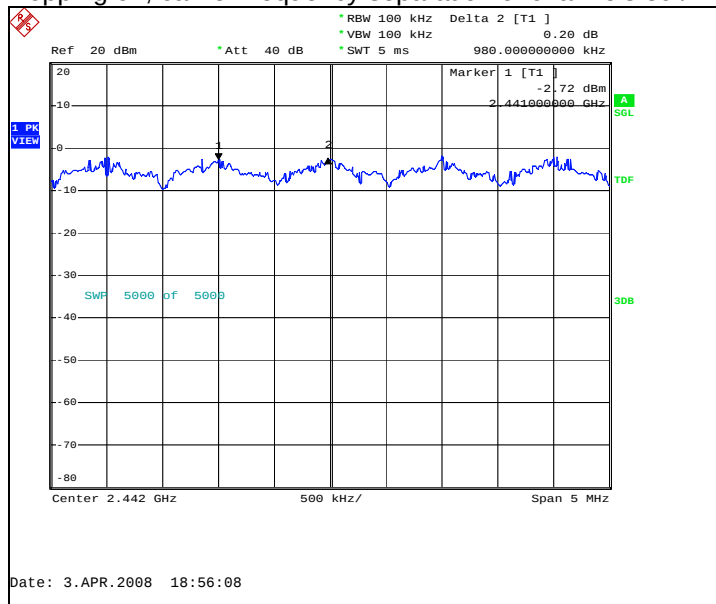
Hopping on, carrier frequency separation of channels 39 / 2441 MHz and 40 / 2442 MHz



9.2.2 8DPSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
980	PASSED

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



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

EUT with DUT number	RM-247, DUT 12708
Accessories with DUT numbers	BL-5F, DUT 12813; AD-54, DUT 12704; HS-45, DUT 12705; AC-5E, DUT 12814
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 41 / 101
Date of measurements	03-Apr-2008
Measured by	Anni Manninen / Jouko Kaivonen

10.1. 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

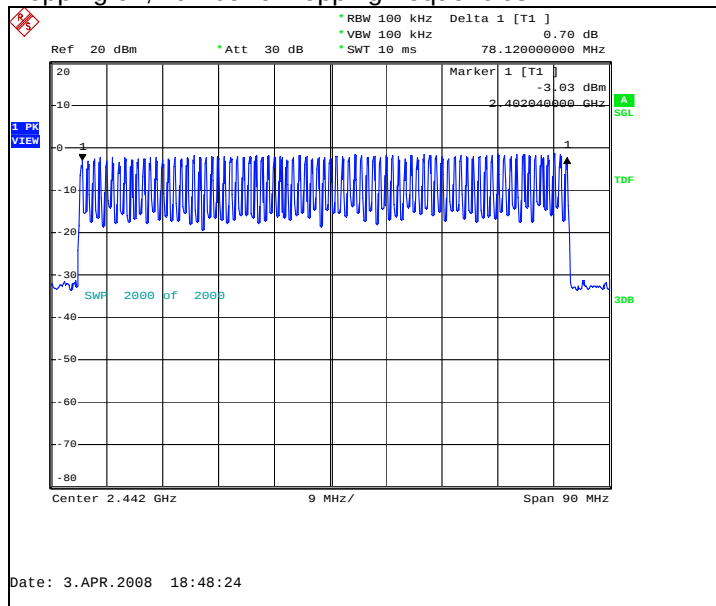
Limit [number]
≥ 15

10.2. Bluetooth Test results

10.2.1 GFSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
79	PASSED

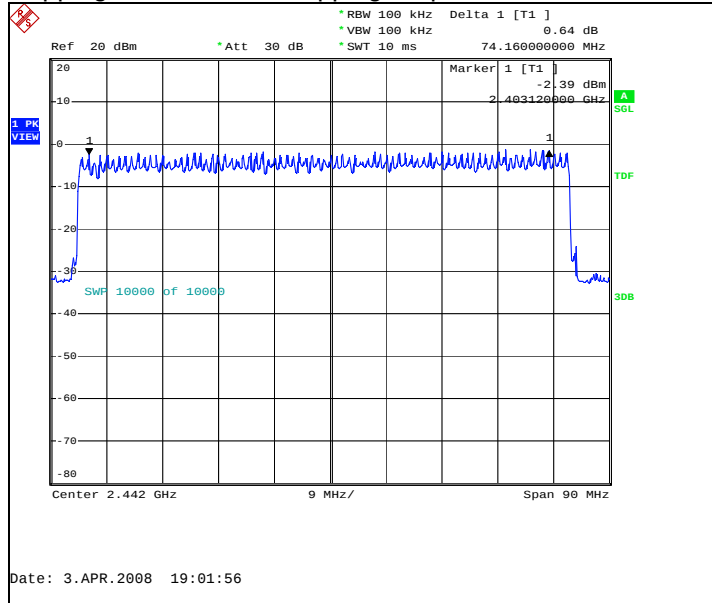
Hopping on, number of hopping frequencies



10.2.2 8DPSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
79	PASSED

Hopping on, number of hopping frequencies



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

EUT with DUT number	RM-247, DUT 12708
Accessories with DUT numbers	BL-5F, DUT 12813; AD-54, DUT 12704; HS-45, DUT 12705; AC-5E, DUT 12814
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 41 / 101
Date of measurements	03-Apr-2008
Measured by	Anni Manninen / Jouko Kaivonen

11.1. 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

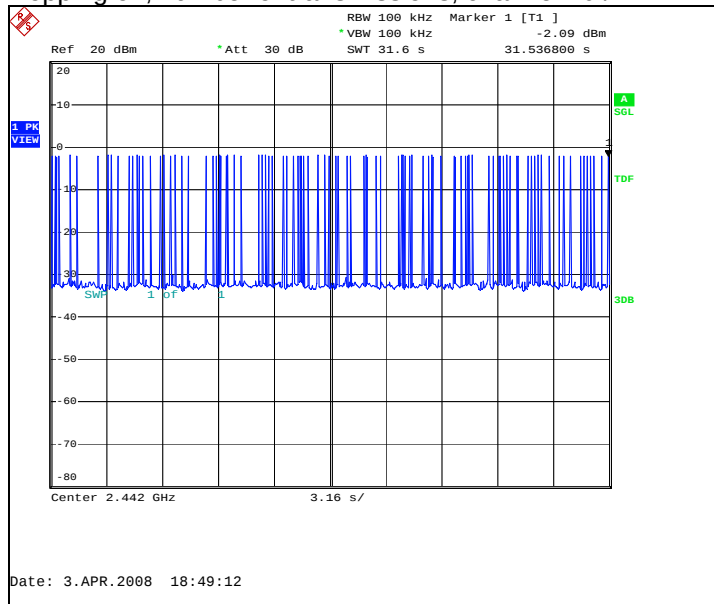
Limit [s]
≤ 0.4

11.2. Bluetooth test results

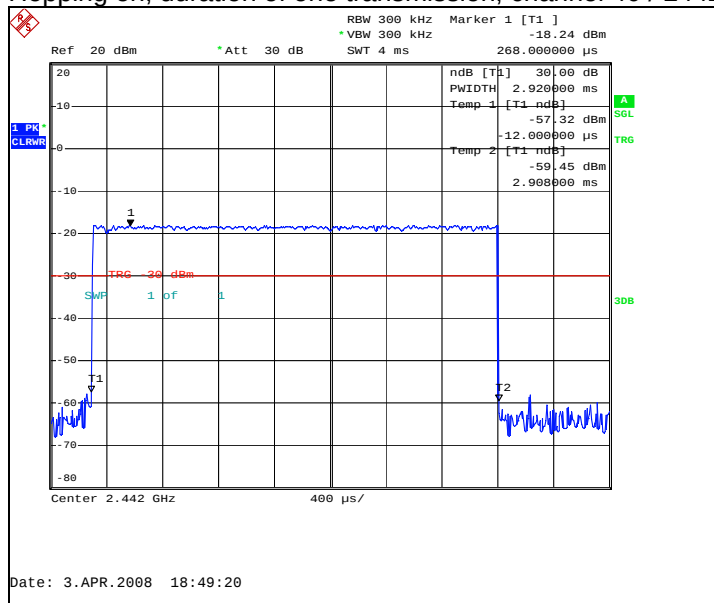
11.2.1 GFSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [μ s]	Time of occupancy [s]	Result
89	2 920	0.259880	PASSED

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



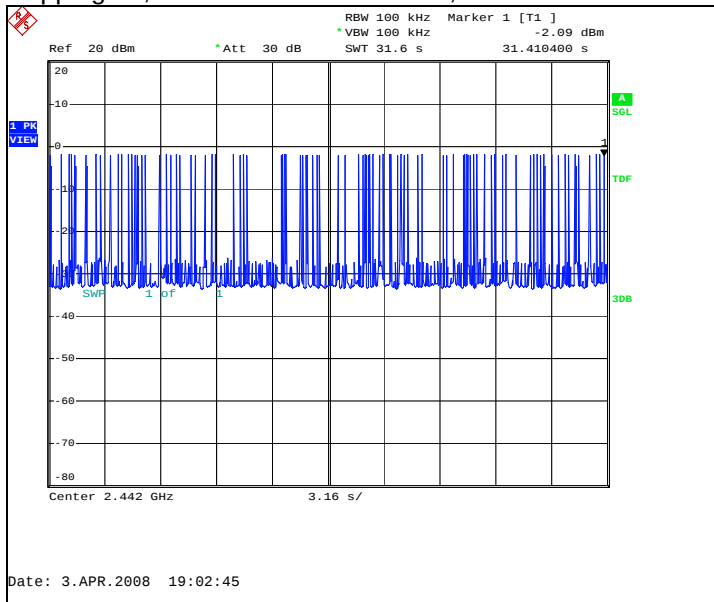
Hopping on, duration of one transmission, channel 40 / 2442 MHz



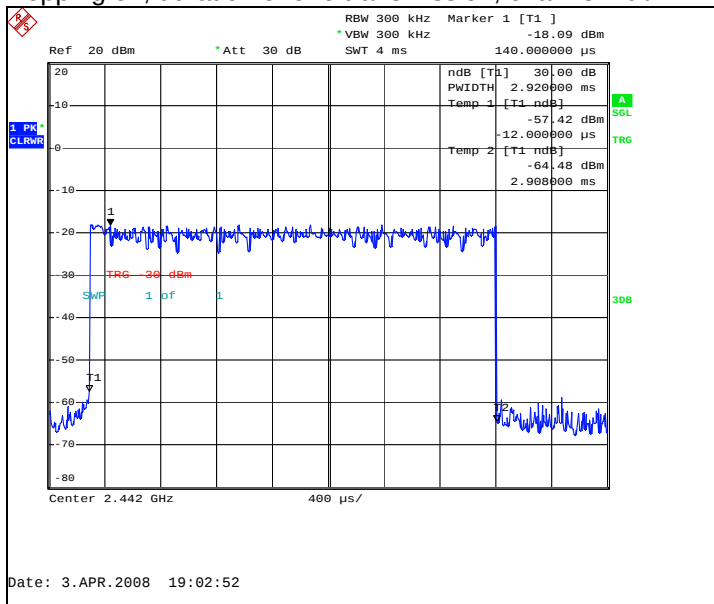
11.2.2 8DPSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [μ s]	Time of occupancy [s]	Result
85	2 920	0.248200	PASSED

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



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



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

EUT with DUT number	RM-247, DUT 12708
Accessories with DUT numbers	BL-5F, DUT 12813; AD-54, DUT 12704; HS-45, DUT 12705; AC-5E, DUT 12814
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 41 / 101
Date of measurements	02-Apr-2008
Measured by	Anni Manninen

12.1. 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

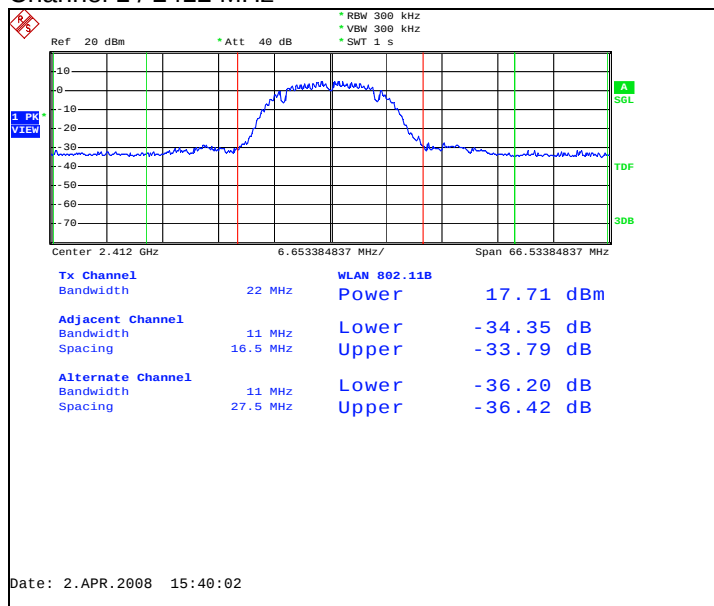
Frequency range [MHz]	Limit [W]	Limit [dBm]
2400 – 2483.5	≤ 1	≤ 30

12.2. WLAN Test results

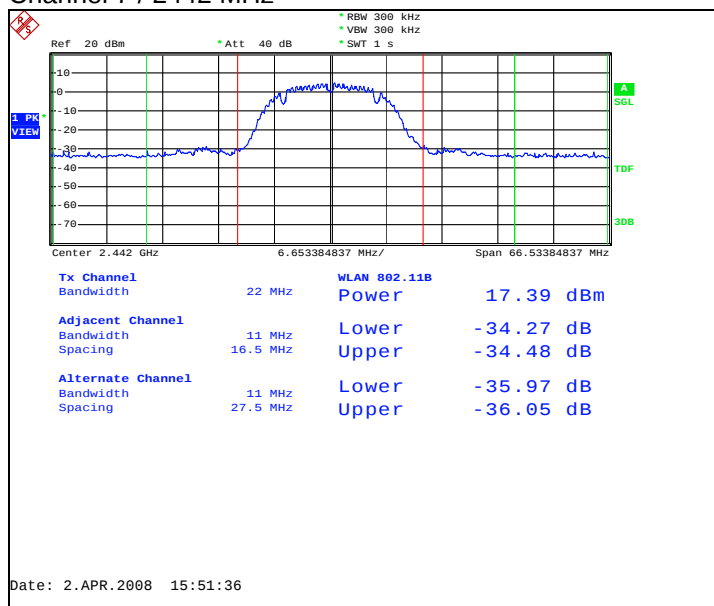
12.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_c [MHz]	P [dBm]	P [W]	Result
1 / 2412	17.71	0.059	PASSED
7 / 2442	17.39	0.055	PASSED
11 / 2462	17.43	0.055	PASSED

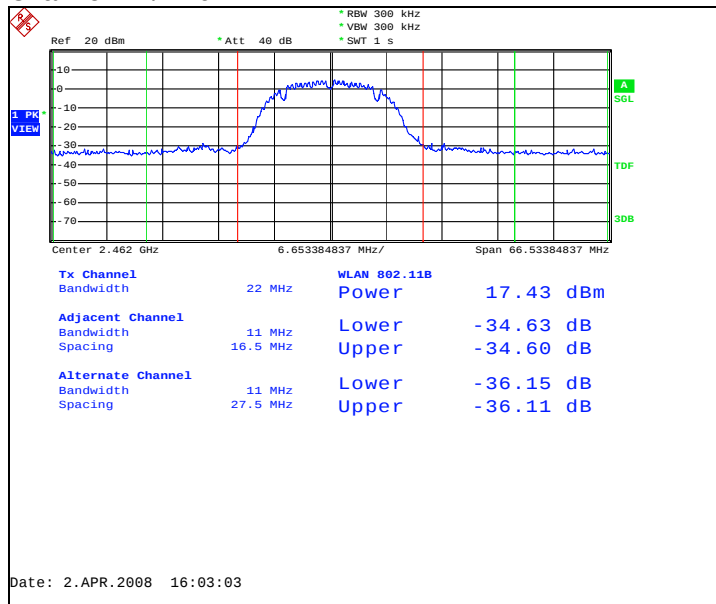
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



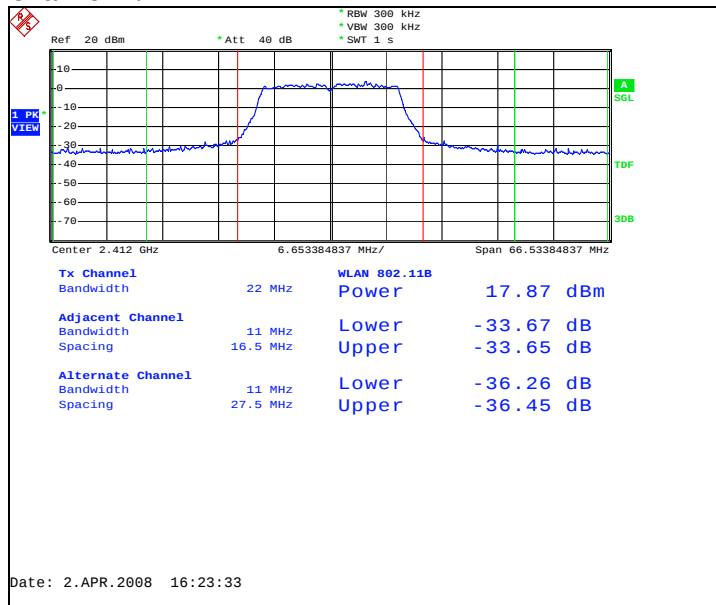
Channel 11 / 2462 MHz



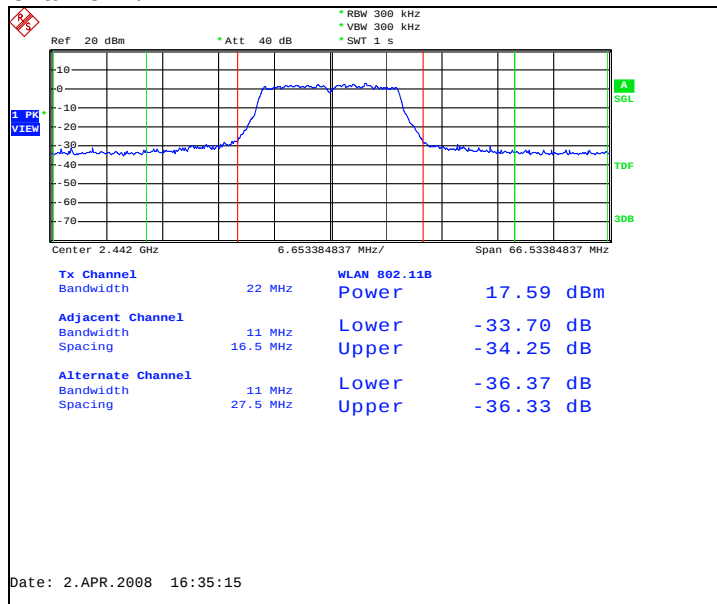
12.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f _c [MHz]	P [dBm]	P [W]	Result
1 / 2412	17.87	0.061	PASSED
7 / 2442	17.59	0.057	PASSED
11 / 2462	17.69	0.059	PASSED

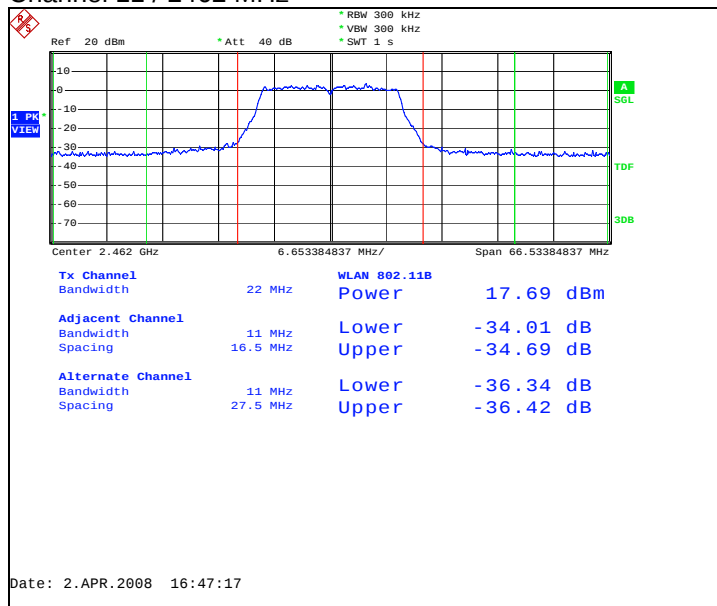
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



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

EUT with DUT number	RM-247, DUT 12648
Accessories with DUT numbers	BL-5F, DUT 12633; AD-54, DUT 12436; HS-45, DUT 12435; AC-5E, DUT 12613
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	18 / 42 / 100.7
Date of measurements	09-Apr-2008
Measured by	Sami Lehtonen

13.1. 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)

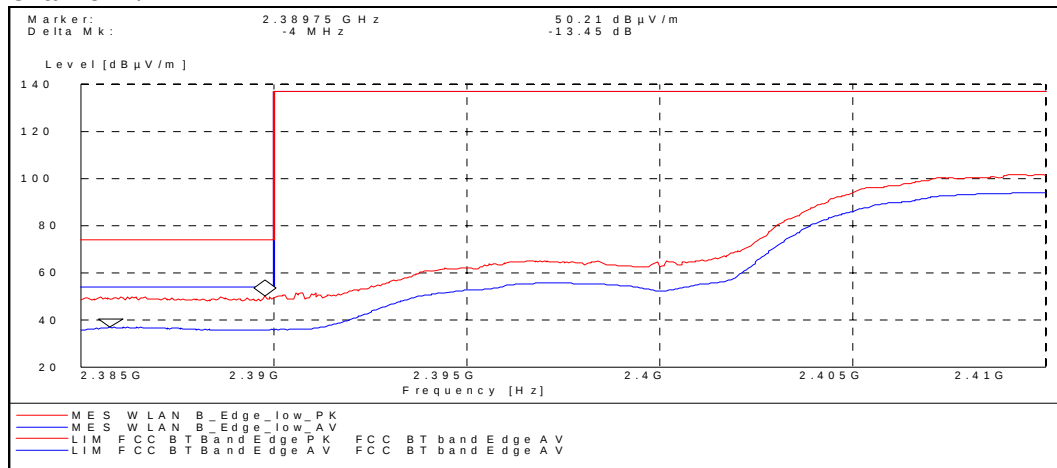
Frequency range [MHz]	Limit Average [dBμV/m]	Limit Peak [dBμV/m]
Below 2390 and above 2483.5	≤ 54	≤ 74

13.2. WLAN Test results

13.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Slide open:

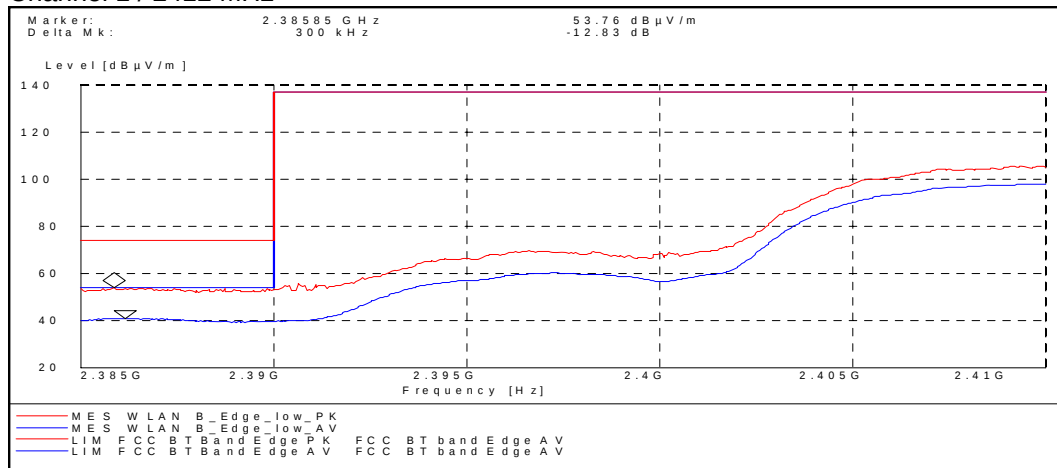
Channel 1 / 2412 MHz



Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	50.20	PASSED
Average	36.80	PASSED

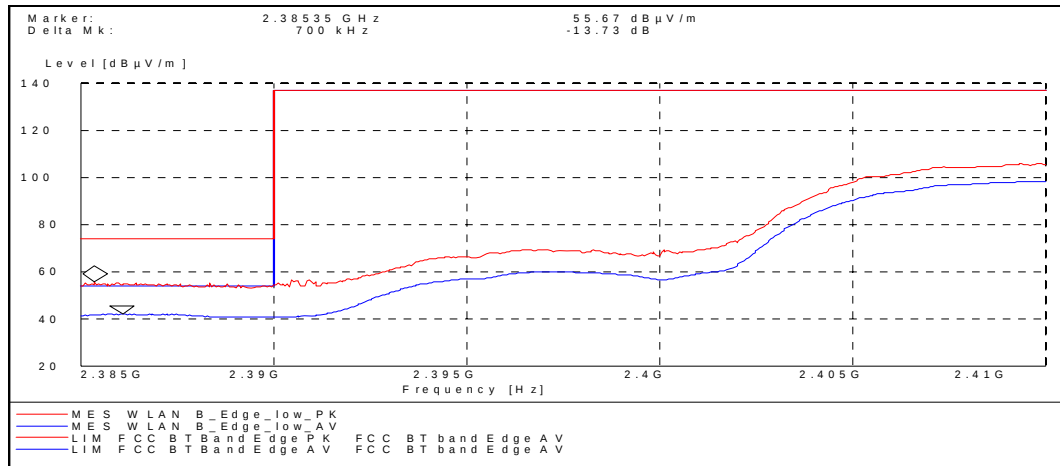
Slide Closed:

Channel 1 / 2412 MHz



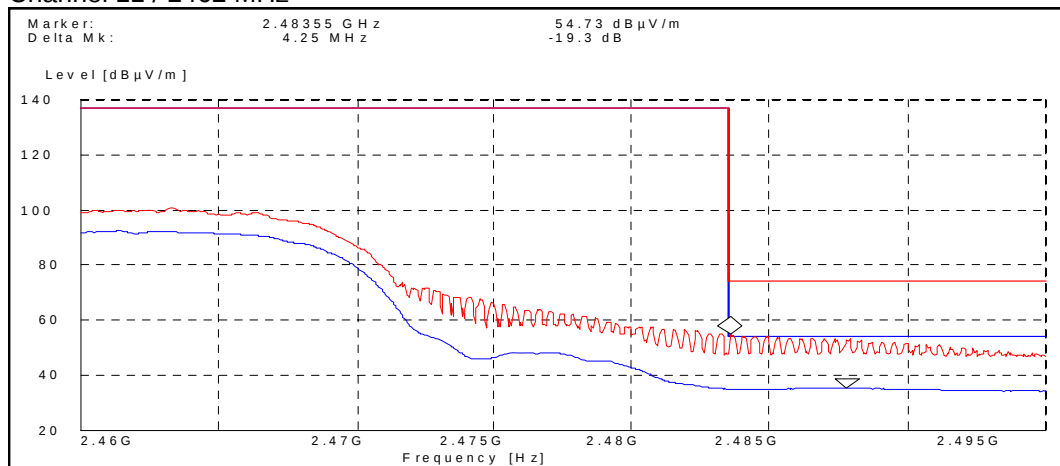
Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	53.80	PASSED
Average	40.90	PASSED

Slide MP3 position:
Channel 1 / 2412 MHz



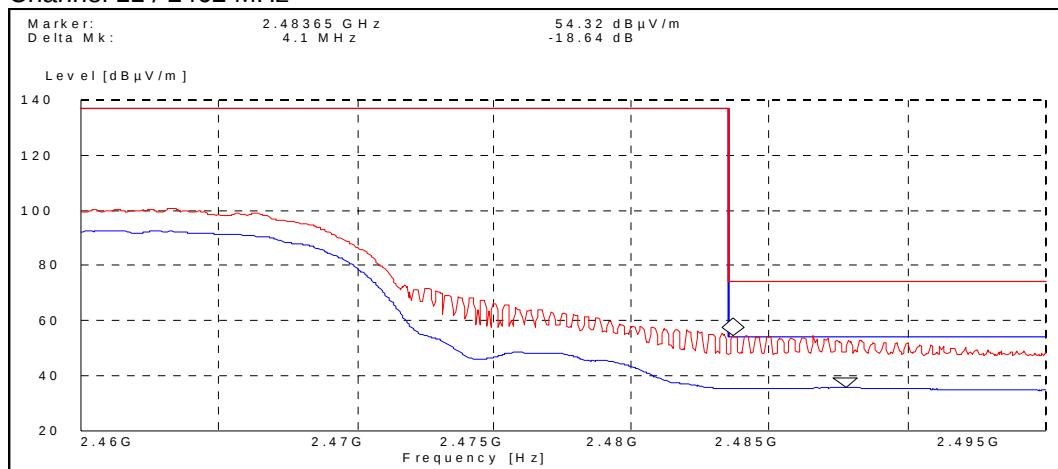
Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	55.70	PASSED
Average	41.90	PASSED

Slide open:
Channel 11 / 2462 MHz



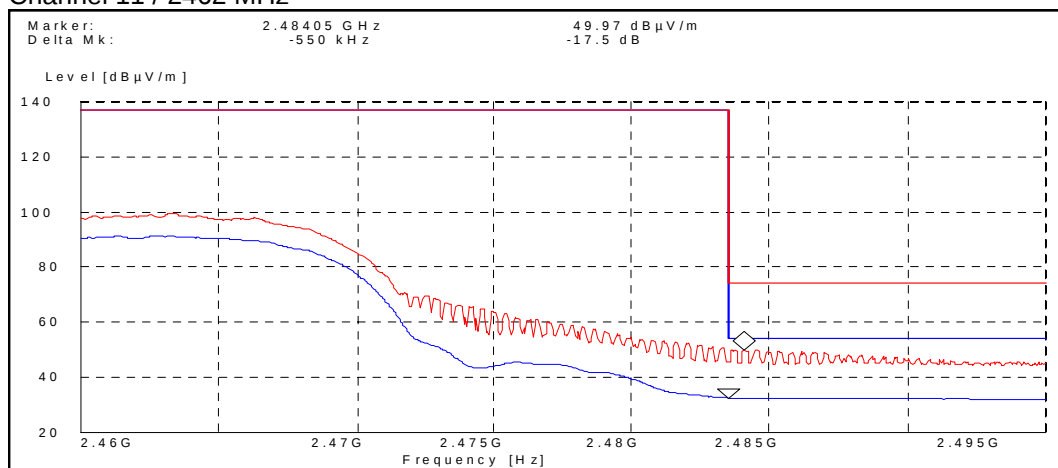
Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	54.70	PASSED
Average	35.40	PASSED

Slide Closed:
Channel 11 / 2462 MHz



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	54.30	PASSED
Average	35.70	PASSED

Slide MP3 position:
Channel 11 / 2462 MHz

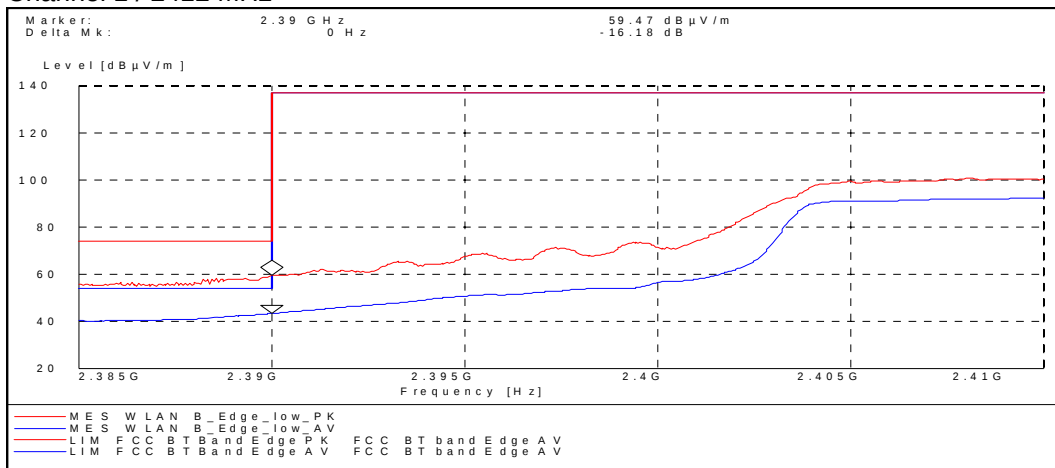


Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	50.00	PASSED
Average	32.50	PASSED

13.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Slide open:

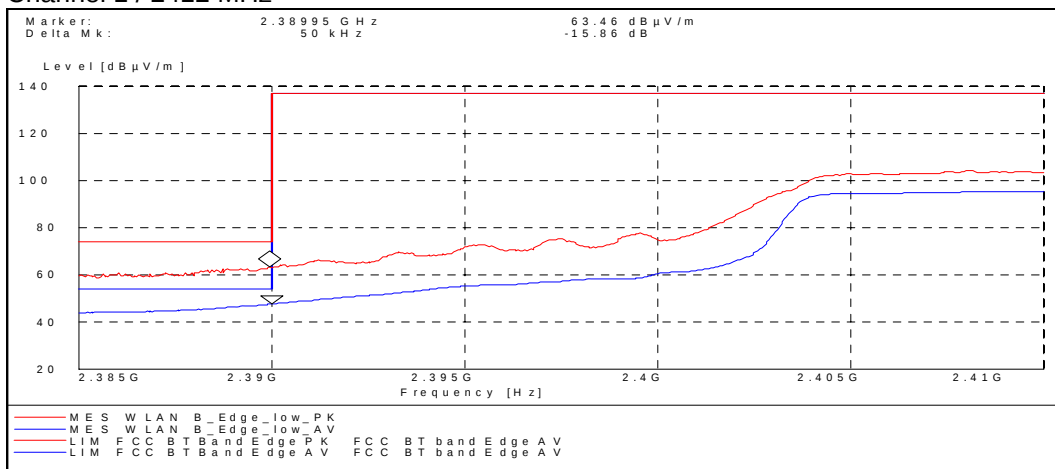
Channel 1 / 2412 MHz



Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	59.50	PASSED
Average	43.30	PASSED

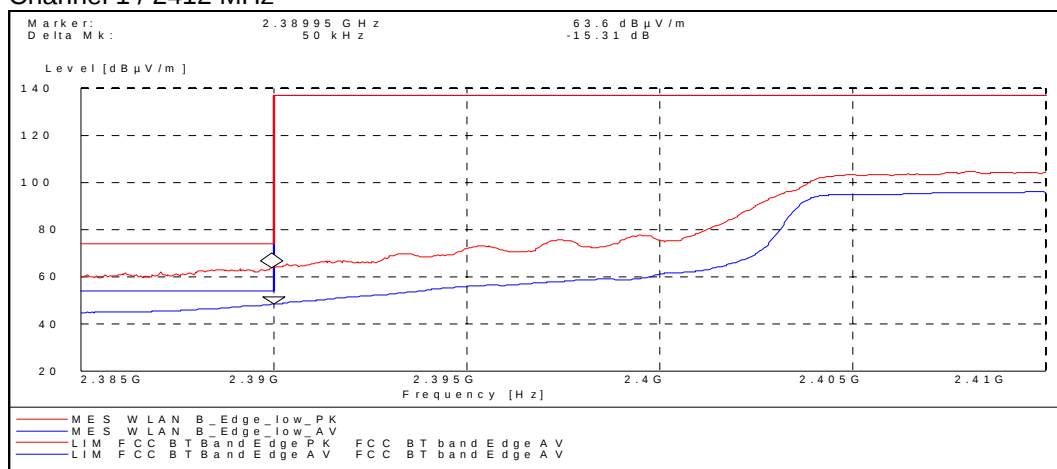
Slide closed:

Channel 1 / 2412 MHz



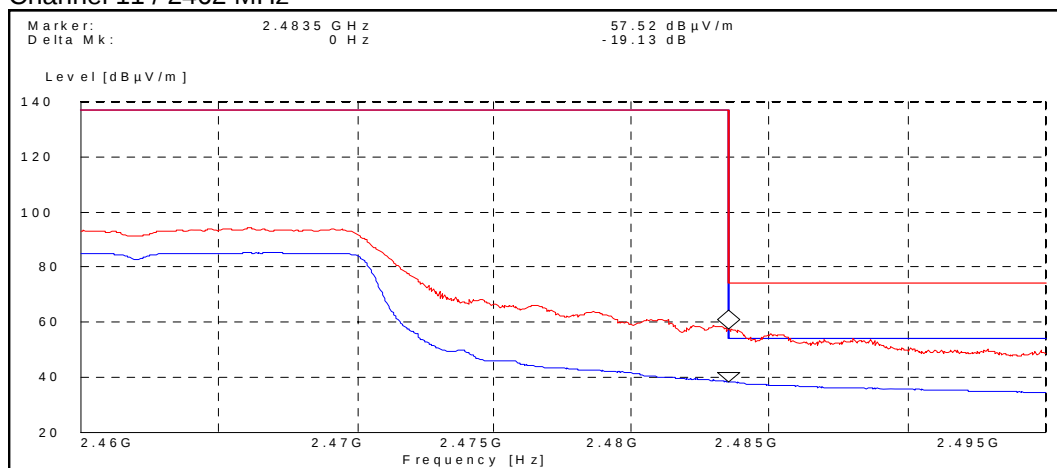
Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	63.50	PASSED
Average	47.60	PASSED

Slide MP3 position:
Channel 1 / 2412 MHz



Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	63.60	PASSED
Average	48.30	PASSED

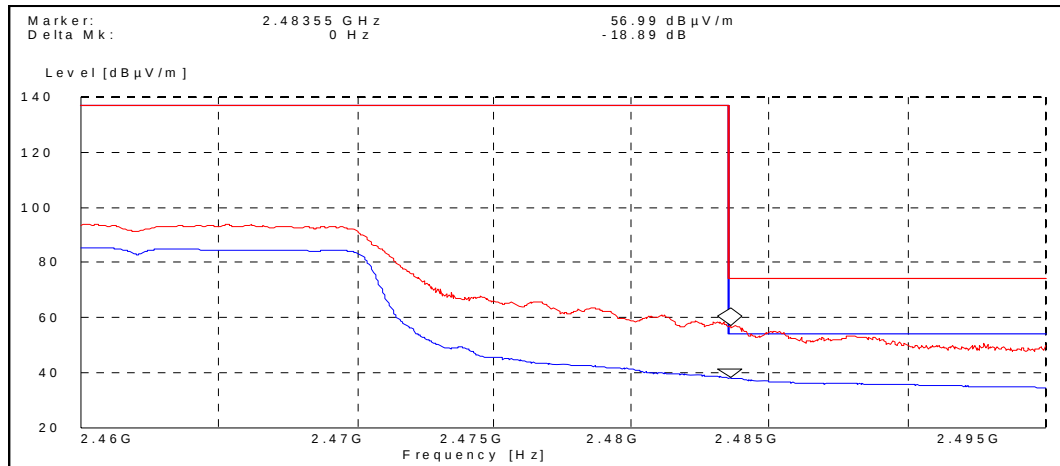
Slide open:
Channel 11 / 2462 MHz



Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	57.50	PASSED
Average	38.40	PASSED

Slide closed:

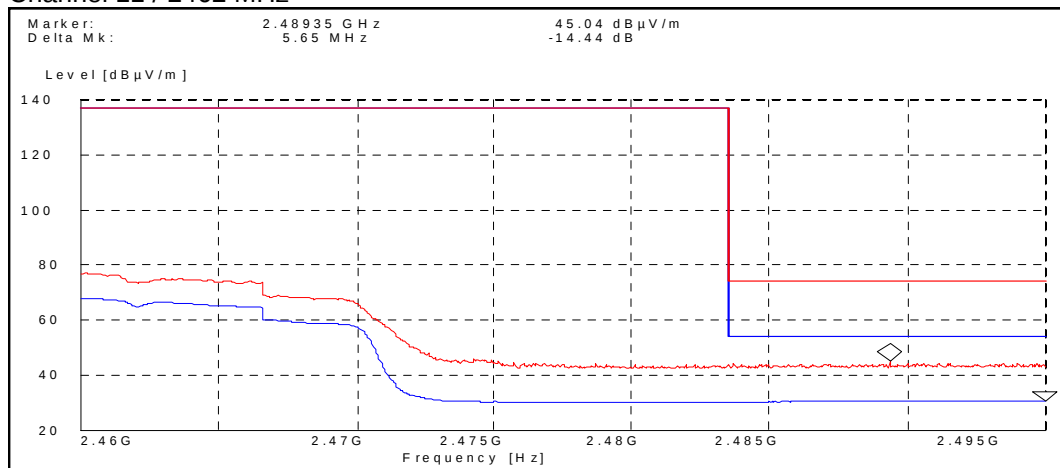
Channel 11 / 2462 MHz



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	57.00	PASSED
Average	38.10	PASSED

Slide MP3 position:

Channel 11 / 2462 MHz



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	45.00	PASSED
Average	30.60	PASSED

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

EUT with DUT number	RM-247, DUT 12708
Accessories with DUT numbers	BL-5F, DUT 12813; AD-54, DUT 12704; HS-45, DUT 12705; AC-5E, DUT 12814
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 41 / 101
Date of measurements	03-Apr-2008
Measured by	Anni Manninen

14.1. Test method and limit

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

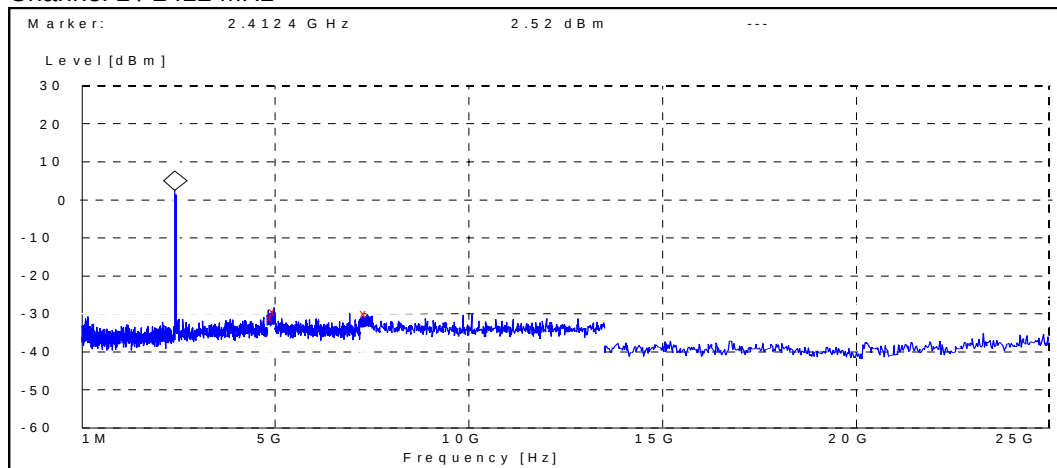
Limits for spurious RF conducted emissions measurements

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

14.2. WLAN Test results

14.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

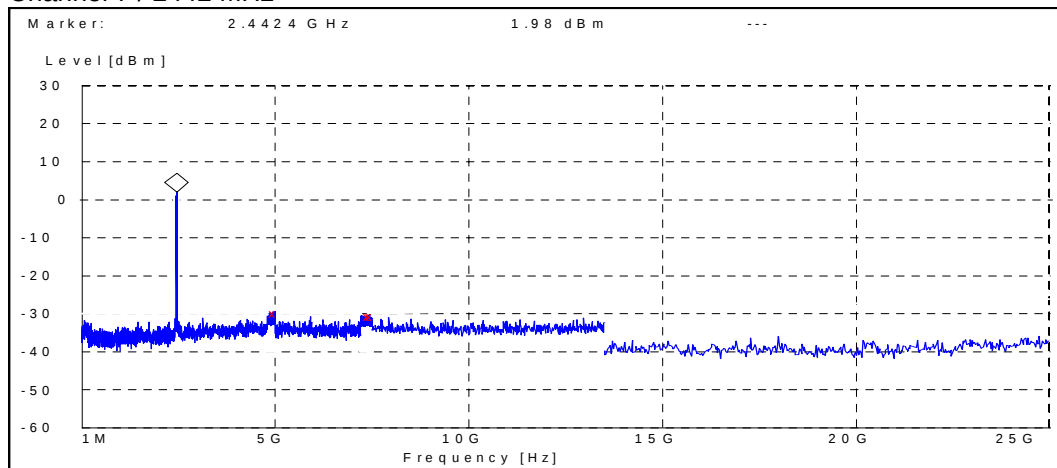
Channel 1 / 2412 MHz



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

Frequency [MHz]	P [dBc]	Result
4954.800000	-33.417191	PASSED
5000.000000	-31.717191	PASSED
7368.600000	-32.517191	PASSED

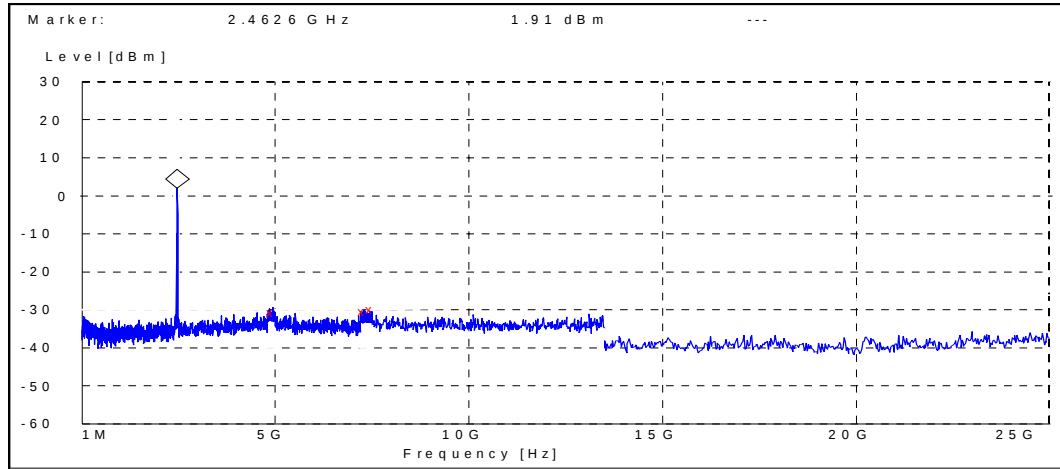
Channel 7 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4993.200000	-31.979539	PASSED
7442.400000	-32.579539	PASSED
7500.000000	-32.479539	PASSED

Channel 11 / 2462 MHz

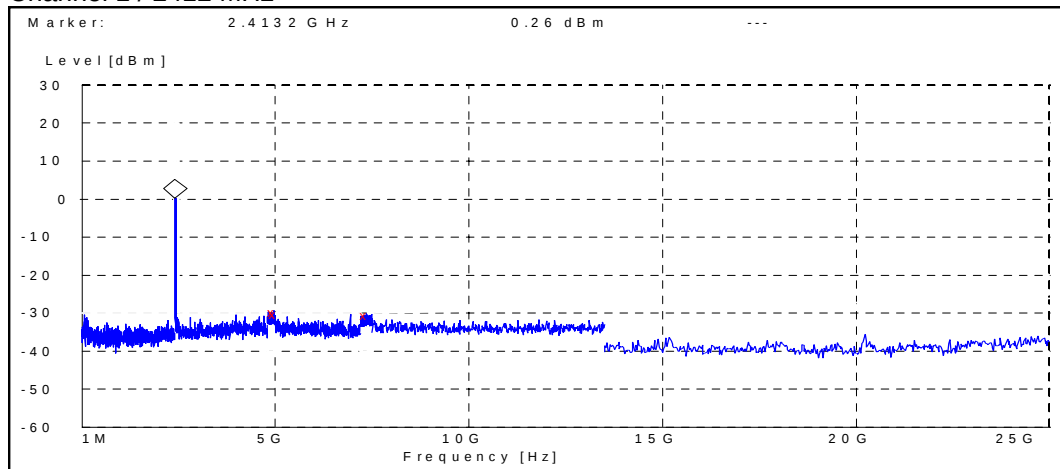


Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4931.600000	-32.409325	PASSED
7280.400000	-32.309325	PASSED
7500.000000	-31.909325	PASSED

14.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

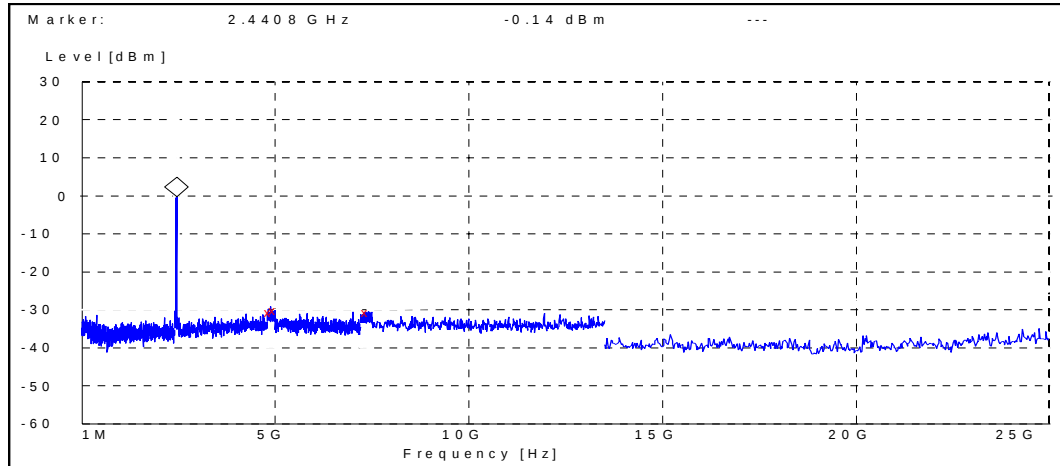
Channel 1 / 2412 MHz



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

Frequency [MHz]	P [dBc]	Result
4981.200000	-30.262662	PASSED
5000.000000	-30.562662	PASSED
7354.800000	-30.762662	PASSED

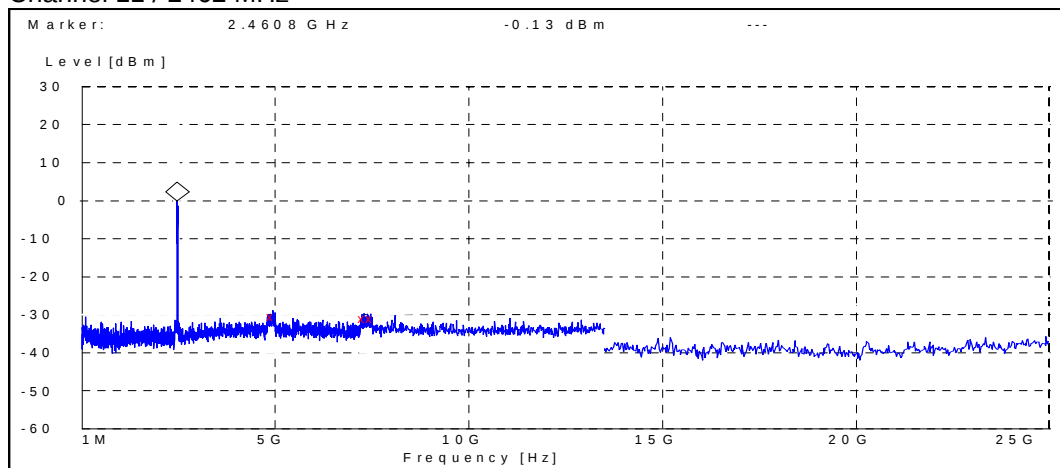
Channel 7 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4873.200000	-30.357145	PASSED
5000.000000	-29.957145	PASSED
7392.600000	-30.357145	PASSED

Channel 11 / 2462 MHz



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

Frequency [MHz]	P [dBc]	Result
4934.800000	-30.372255	PASSED
7285.200000	-30.972255	PASSED
7500.000000	-30.672255	PASSED

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

EUT with DUT number	RM-247, DUT 12648
Accessories with DUT numbers	BL-5F, DUT 12633; AD-54, DUT 12436; HS-45, DUT 12435; AC-5E, DUT 12613
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	18 / 42 / 100.7
Date of measurements	10-Apr-2008
Measured by	Sami Lehtonen

15.1. 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:

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

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 [$\mu\text{V/m}$]	Limit [dB $\mu\text{V/m}$]	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

15.2. WLAN Test results

15.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 1 / 2412 MHz

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

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	51.20	363.08	50.70	0.5	VERTICAL	PASSED
7236.000000	46.20	204.17	43.90	2.3	VERTICAL	PASSED

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

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	39.00	89.13	38.50	0.5	VERTICAL	PASSED
7236.000000	33.70	48.42	31.40	2.3	HORIZONTAL	PASSED

Channel 7 / 2442 MHz

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

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
37.695391	21.90	12.45	42.10	-20.2	VERTICAL	PASSED
65.631663	19.20	9.12	50.40	-31.2	HORIZONTAL	PASSED
74.567535	15.80	6.17	44.90	-29.1	HORIZONTAL	PASSED

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

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
2381.456914	51.40	371.54	55.30	-3.9	VERTICAL	PASSED
4884.269539	52.20	407.38	51.60	0.6	VERTICAL	PASSED
7326.149299	48.10	254.10	45.70	2.4	HORIZONTAL	PASSED
13325.149299	53.20	457.09	40.30	12.9	VERTICAL	PASSED
13358.215431	54.40	524.81	41.00	13.4	VERTICAL	PASSED
15899.803607	54.30	518.80	37.40	16.9	VERTICAL	PASSED
16172.844689	54.50	530.88	37.50	17.0	VERTICAL	PASSED
17905.307615	56.10	638.26	37.50	18.6	VERTICAL	PASSED

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

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
2384.956914	39.00	89.13	42.90	-3.9	VERTICAL	PASSED
4884.269539	42.50	133.35	41.90	0.6	VERTICAL	PASSED

7328.649299	35.10	56.89	32.70	2.4	HORIZONTAL	PASSED
13320.649299	40.50	105.93	27.60	12.9	VERTICAL	PASSED
13361.215431	40.70	108.39	27.30	13.4	VERTICAL	PASSED
15902.303607	41.60	120.23	24.70	16.9	VERTICAL	PASSED
16175.844689	41.90	124.45	24.80	17.1	VERTICAL	PASSED
17907.307615	43.50	149.62	24.90	18.6	VERTICAL	PASSED

Channel 11 / 2462 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	60.20	1 023.29	60.10	0.1	VERTICAL	PASSED
7386.000000	49.50	298.54	46.40	3.1	HORIZONTAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	49.00	281.84	48.90	0.1	VERTICAL	PASSED
7386.000000	36.90	69.98	33.80	3.1	HORIZONTAL	PASSED

15.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 1 / 2412 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	48.00	251.19	47.50	0.5	VERTICAL	PASSED
7236.000000	46.20	204.17	43.90	2.3	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	34.60	53.70	34.10	0.5	VERTICAL	PASSED
7236.000000	33.70	48.42	31.40	2.3	HORIZONTAL	PASSED

Channel 7 / 2442 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
37.895391	21.80	12.30	42.10	-20.3	VERTICAL	PASSED
74.008016	14.30	5.19	43.40	-29.1	HORIZONTAL	PASSED
74.369940	15.70	6.10	44.80	-29.1	HORIZONTAL	PASSED
115.911222	17.20	7.24	43.50	-26.3	HORIZONTAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2379.142285	54.10	506.99	58.10	-4.0	VERTICAL	PASSED
2497.548096	51.70	384.59	55.80	-4.1	VERTICAL	PASSED
4883.769539	52.80	436.52	52.20	0.6	VERTICAL	PASSED
7325.651303	50.10	319.89	47.70	2.4	HORIZONTAL	PASSED
12465.923848	52.20	407.38	41.40	10.8	VERTICAL	PASSED

13331.169339	53.70	484.17	40.70	13.0	VERTICAL	PASSED
15871.745491	54.10	506.99	37.70	16.4	VERTICAL	PASSED
16180.358717	54.90	555.90	37.70	17.2	VERTICAL	PASSED
17822.653307	55.80	616.60	37.50	18.3	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2381.142285	41.20	114.82	45.10	-3.9	VERTICAL	PASSED
2497.048096	38.00	79.43	42.10	-4.1	VERTICAL	PASSED
4881.769539	38.10	80.35	37.50	0.6	VERTICAL	PASSED
7323.651303	34.60	53.70	32.20	2.4	HORIZONTAL	PASSED
12459.923848	39.50	94.41	28.70	10.8	VERTICAL	PASSED
13338.169339	40.70	108.39	27.60	13.1	VERTICAL	PASSED
15875.245491	41.50	118.85	25.00	16.5	VERTICAL	PASSED
16175.858717	41.90	124.45	24.80	17.1	VERTICAL	PASSED
17824.653307	42.90	139.64	24.50	18.4	VERTICAL	PASSED

Channel 11 / 2462 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	61.50	1 188.50	61.40	0.1	VERTICAL	PASSED
7386.000000	52.30	412.10	49.20	3.1	HORIZONTAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	46.40	208.93	46.30	0.1	VERTICAL	PASSED
7386.000000	36.60	67.61	33.50	3.1	HORIZONTAL	PASSED

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

EUT with DUT number	RM-247, DUT 12812
Accessories with DUT numbers	BL-5F, DUT 12813; AD-54, DUT 12704; HS-45, DUT 12705; AC-5E, DUT 12814
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 41 / 101
Date of measurements	03-Apr-2008
Measured by	Anni Manninen / Jouko Kaivonen

16.1. 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.

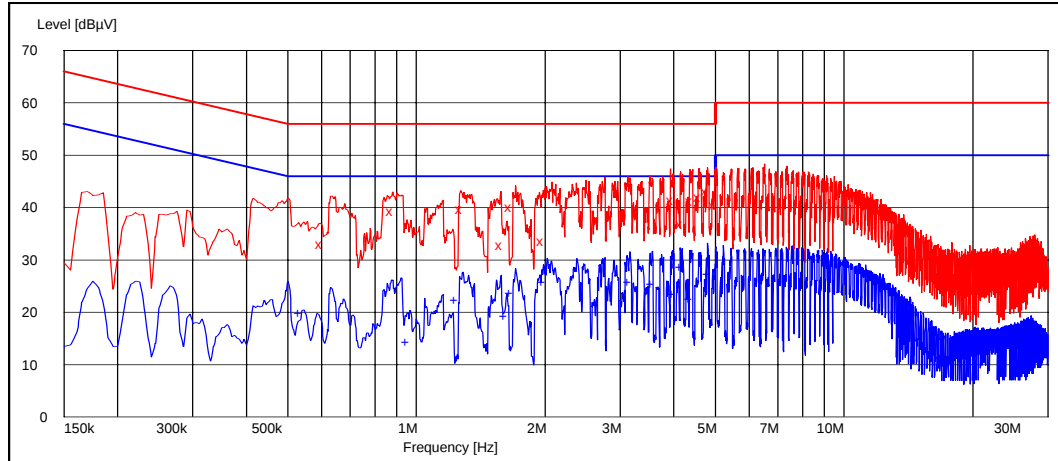
CISPR 22 Class B limits

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

16.2. WLAN Test results

16.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 7 / 2442 MHz



Quasi peak (RBW: 9 kHz)

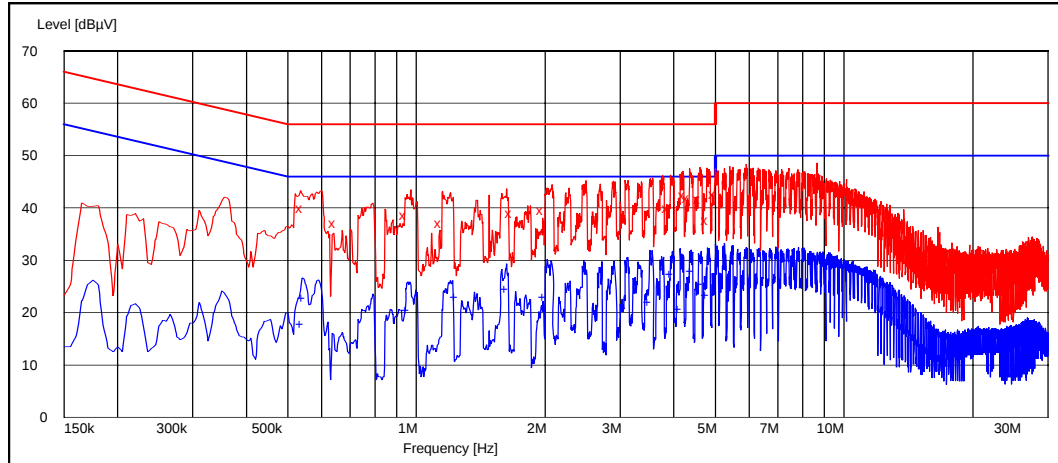
Frequency [MHz]	U [dBμV]	Line	Result
0.600000	33.10	N	PASSED
0.880000	39.40	L1	PASSED
1.275000	39.80	L1	PASSED
1.585000	32.80	N	PASSED
1.665000	40.00	L1	PASSED
1.980000	33.70	N	PASSED
3.970000	41.50	L1	PASSED
4.180000	36.80	N	PASSED
4.400000	41.30	L1	PASSED
4.610000	42.00	L1	PASSED
4.800000	43.10	L1	PASSED
4.985000	40.50	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.535000	19.80	L1	PASSED
0.955000	14.40	N	PASSED
1.240000	22.30	L1	PASSED
1.615000	19.20	N	PASSED
1.670000	23.70	L1	PASSED
1.985000	25.80	L1	PASSED
3.155000	25.70	L1	PASSED
3.570000	25.30	L1	PASSED
4.010000	23.50	N	PASSED
4.175000	28.60	L1	PASSED
4.380000	22.50	N	PASSED
4.835000	27.20	L1	PASSED

16.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 7 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.540000	39.90	L1	PASSED
0.645000	37.20	L1	PASSED
0.945000	38.70	L1	PASSED
1.140000	37.10	L1	PASSED
1.670000	39.10	L1	PASSED
1.975000	39.50	L1	PASSED
3.885000	40.00	L1	PASSED
4.240000	42.40	L1	PASSED
4.325000	41.90	L1	PASSED
4.600000	41.70	L1	PASSED
4.790000	37.70	N	PASSED
4.990000	42.70	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.540000	17.80	N	PASSED
0.545000	22.70	L1	PASSED
0.955000	20.40	L1	PASSED
1.240000	22.90	L1	PASSED
1.625000	24.50	L1	PASSED
1.995000	22.90	L1	PASSED
3.515000	22.00	N	PASSED
3.955000	27.30	L1	PASSED
4.135000	20.60	N	PASSED
4.420000	28.00	L1	PASSED
4.630000	25.40	L1	PASSED
4.795000	23.30	N	PASSED

17. 6 dB bandwidth (FCC §15.247(a)(2), RSS-210 A8.2 (1))

EUT with DUT number	RM-247, DUT 12708
Accessories with DUT numbers	BL-5F, DUT 12813; AD-54, DUT 12704; HS-45, DUT 12705; AC-5E, DUT 12814
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 41 / 101
Date of measurements	02-Apr-2008
Measured by	Anni Manninen

17.1. 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

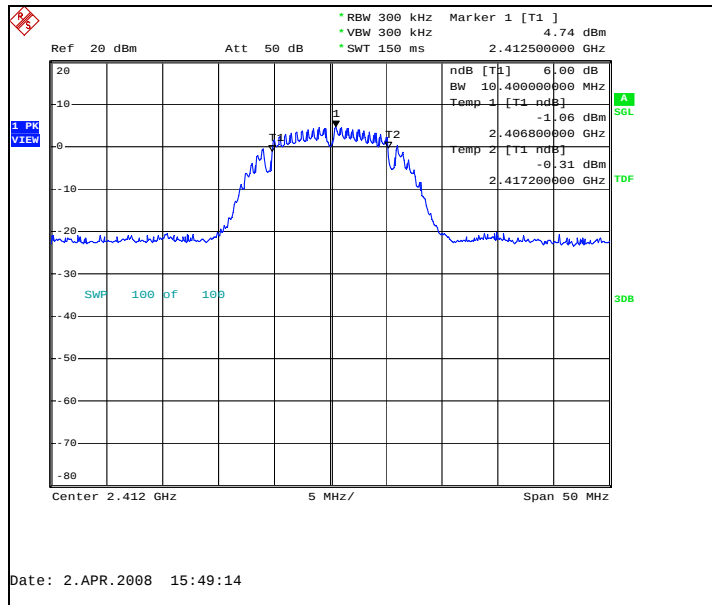
Limit [kHz]
≥ 500

17.2. WLAN test results

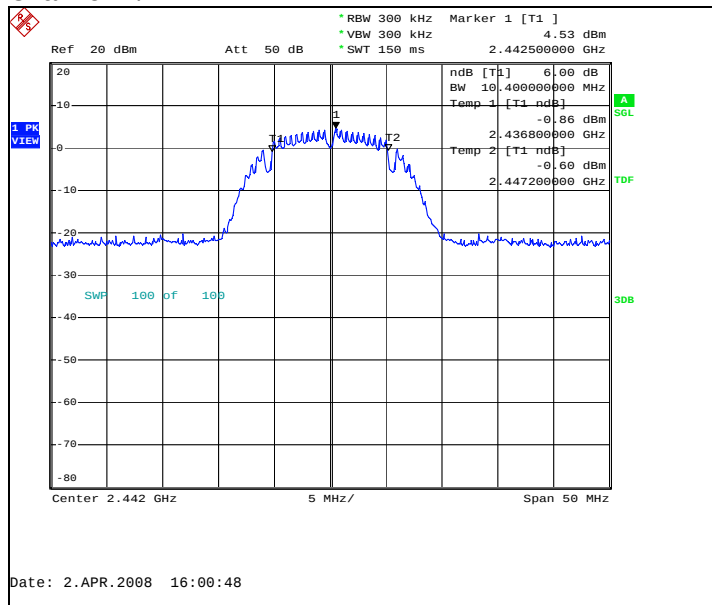
17.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

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

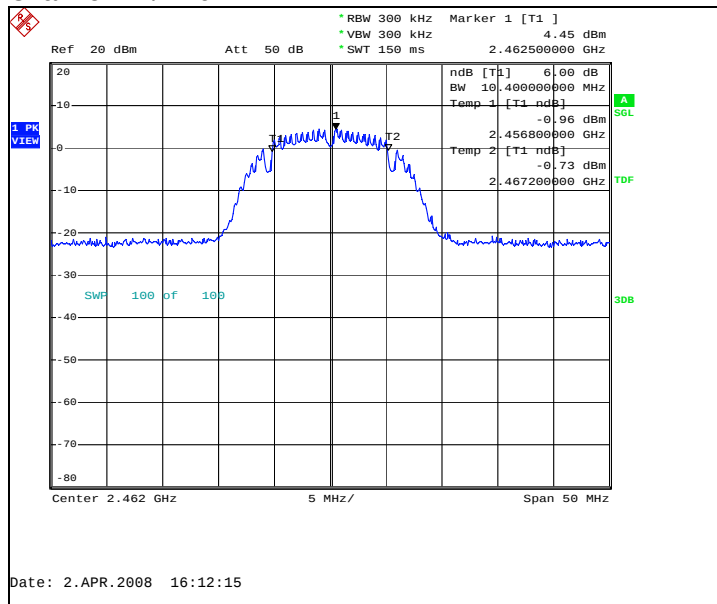
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



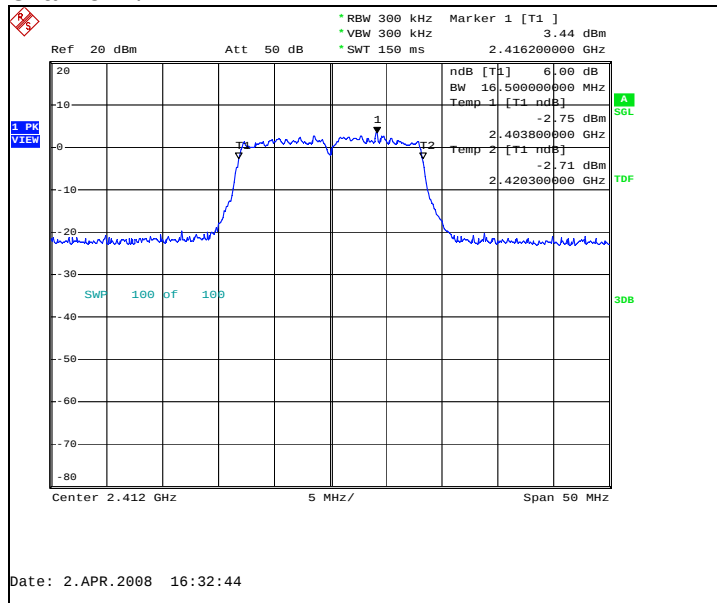
Channel 11 / 2462 MHz



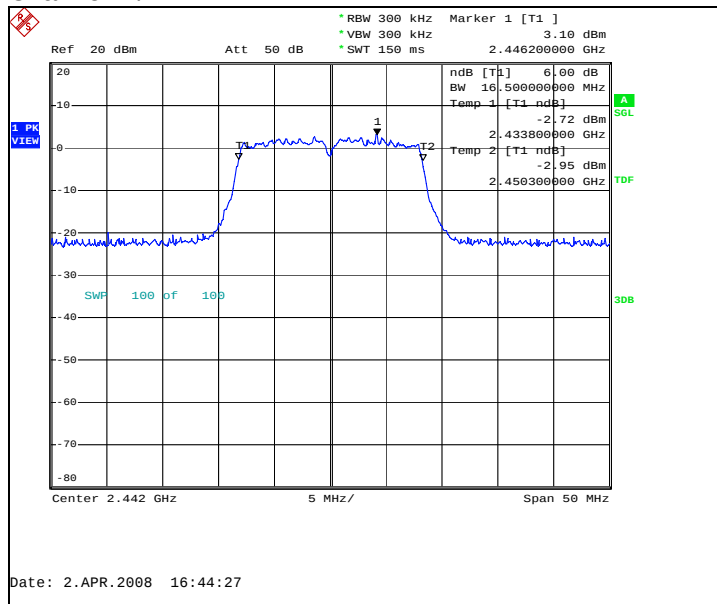
17.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

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

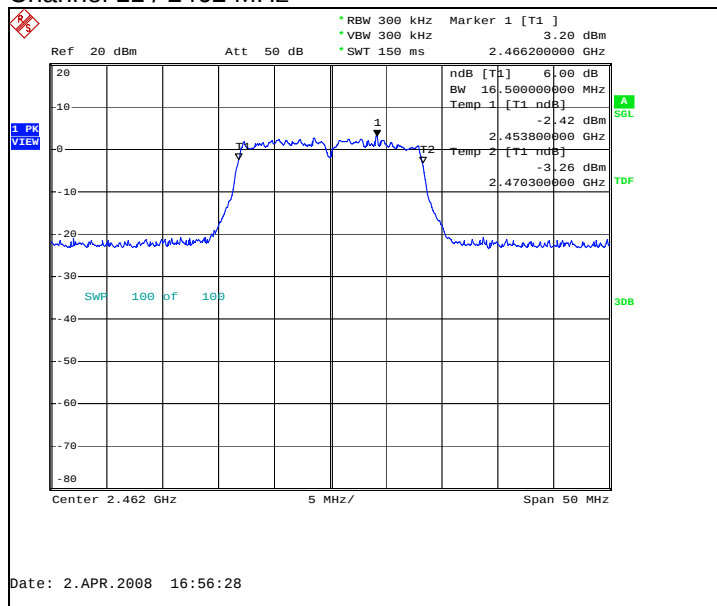
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



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

EUT with DUT number	RM-247, DUT 12708
Accessories with DUT numbers	BL-5F, DUT 12813; AD-54, DUT 12704; HS-45, DUT 12705; AC-5E, DUT 12814
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 41 / 101
Date of measurements	02-Apr-2008
Measured by	Anni Manninen

18.1. 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

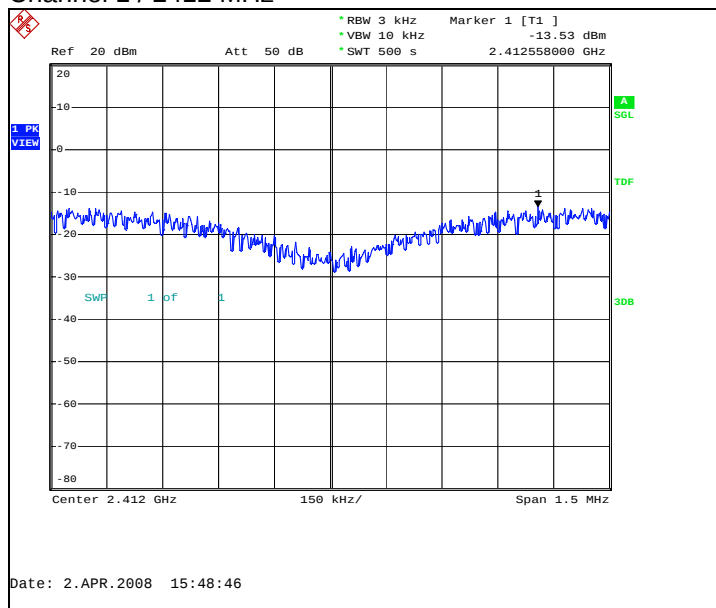
Limit [dBm] @ 3 kHz
≤ 8

18.2. WLAN test results

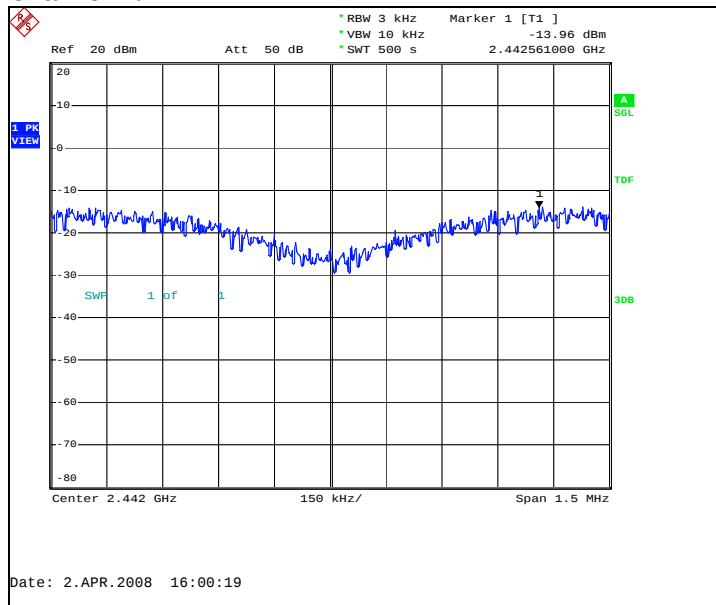
18.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-13.53	PASSED
7 / 2442	-13.96	PASSED
11 / 2462	-13.79	PASSED

Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



Ref 20 dBm Att 50 dB 2.462558000 GHz

RBW 3 kHz VBW 10 kHz SWT 500 s Marker 1 [T1] -13.79 dBm

PR VIEW

SWR 1 0f 1

A SGL TDF 3DB

Center 2.462 GHz 150 kHz/ Span 1.5 MHz

Date: 2.APR.2008 16:11:46

Channel / f_c [MHz]	P [dBm]	Result
1 / 2412	-16.79	PASSED
7 / 2442	-16.84	PASSED
11 / 2462	-16.76	PASSED

* RBW 3 kHz
 * VBW 10 kHz
 * SWT 500 s

Ref 20 dBm
 Att 50 dB
 Marker 1 [T1]
 -16.79 dBm
 2.411415000 GHz

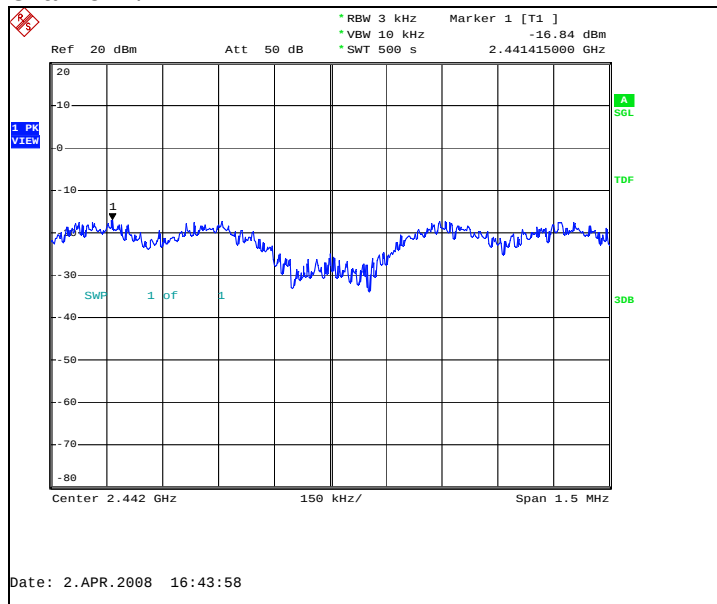
1
 SWR 1.07
 1

A SGL
 TDF
 3DB

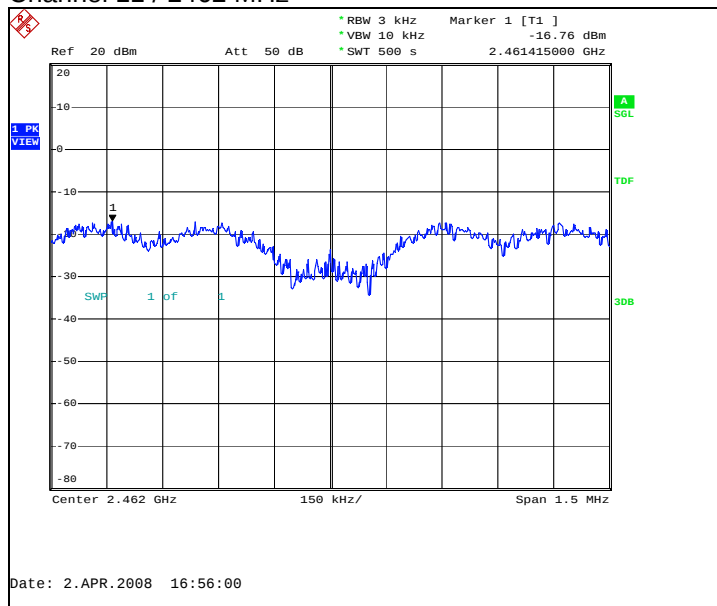
Center 2.412 GHz
 150 kHz/
 Span 1.5 MHz

Date: 2.APR.2008 16:32:16

Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



19. Test Equipment

19.1. 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	22/24/27, 15C, 15B
2352	Spectrum Analyzer	FSP	R&S	22/24/27, 15C
2359	Temperature Test system	VT4002	Vötsch Industrietechnik	22/24/27
2360	Serial Bus Converter	Serial 488A	IO Tech	22/24/27
2362	Power Supply	NGPX 70/5	R&S	22/24/27
2388	Bluetooth Tester	CBT	R&S	15C, 15B
-	RF Emission Software	ES-K1 v.1.71	R&S	22/24/27, 15C, 15B

19.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1748	Log. per. Antenna	HL025	R&S	22/24/27, 15C
1749	Log. per. Antenna	HL025	R&S	22/24/27, 15C
1875	Thermo- Hygrograph	00.02520.150700	Lambrecht	22/24/27, 15C, 15B
1917	Radio Communication tester	CMTA84	R&S	22/24/27, 15C, 15B
1933	Precision half-wave dipole antennas	HZ-13	R&S	22/24/27, 15C
1938	Precision half-wave dipole antennas	HZ-12	R&S	22/24/27, 15C
2006	Radiation Reference Source	VSQ	MEB	22/24/27, 15C, 15B
2009	Signal generator	SMP 22	R&S	22/24/27, 15C, 15B
2019	Multimeter	34401A	HP	22/24/27, 15C, 15B
2027	Coupling and Decoupling Network	M2 (modified) DC1	MEB	22/24/27, 15C, 15B
2028	Coupling and Decoupling Network	M3 (modified) DC2	MEB	22/24/27, 15C, 15B
2029	Power Supply	PL330	THURLBY	22/24/27, 15C, 15B
2043	Band Reject Filter	WRCA824/849-0.2-6SS	Wainwright	22, 15C, 15B
2047	Band Reject Filter	WRCC1800/2000-0.2-10SS	Wainwright	24, 15C, 15B
2048	Band Reject Filter	WRCC1700/1800-0.2-10SS	Wainwright	27, 15C, 15B
2051	High Pass Filter	4HC1700-1-KK	R&S	22/24/27, 15C
2057	Log. per. Antenna	HL025	R&S	22/24/27, 15C
2109	Power Supply	PL330QMD	THURLBY	22/24/27, 15C, 15B
2110	Multimeter	34401A	HP	22/24/27, 15C, 15B
2112	Multimeter	TX3	Tektronix	22/24/27, 15C, 15B
2116	Controller	EMCO MODEL 2090	ETS	22/24/27, 15C, 15B
2133	Power Meter	NRVS	R&S	22/24/27, 15C
2134	Power Sensor	NRV-Z32	R&S	22/24/27, 15C
2135	Coupling and Decoupling Network	CDN 801-M3	LÜTHI	22/24/27, 15C, 15B

Eq. No	Equipment	Type	Manufacturer	Used in
2138	Ultra Broadband Antenna	HL562	R&S	22/24/27, 15C, 15B
2140	Biconical Antenna	EMCO93110B	EMCO	22/24/27, 15C
2142	Log.-per.-dipol Antenna	3146	EMCO	22/24/27, 15C
2144	Attenuator	6803.17B	Huber-Suhner	22/24/27, 15C, 15B
2150	High Pass Filter	F-15041	RLC ELECTRONICS	22/24/27, 15C
2176	Coupling and Decoupling Network	CDN 801-M3	LÜTHI	22/24/27, 15C, 15B
2180	Digital Radio Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2188	Preamplifier	AFS4-00100300-20-23P-6	MITEQ	22/24/27, 15C, 15B
2330	EMI Test receiver	ESIB26	R&S	22/24/27, 15C, 15B
2334	GPIB Switch 2 to 1	-	National Instruments	22/24/27, 15C, 15B
2348	Yaesu controller	G-1000DXC	YAESU	22/24/27, 15C, 15B
2349	Computer controller (Yaesu)	GS-232B	YAESU	22/24/27, 15C, 15B
2350	Preamplifier	AMF-6D-020180-29-20P	MITEQ	22/24/27, 15C
2361	Anechoic chamber	3 meter semi/full anechoic chamber	Euroshield	22/24/27, 15C, 15B
2398	Horn antenna	HF906	R&S	22/24/27, 15C
2363	Band Reject Filter	WRCG 832/838-825/845/5SS	Wainwright	22/24/27
2364	Band Reject Filter	WRCG1877/1883 - 1870/1890-40/6SS	Wainwright	22/24/27
2365	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
2366	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
2384	Band Reject Filter	WRCG832/838-825/845-40/5SS	Wainwright	22/24/27
2388	Bluetooth Tester	CBT	R&S	15C, 15B
-	RF Emission Software	ES-K1 v.1.71	R&S	22/24/27, 15C, 15B