TCC Nokia

FINAS Finnish Accreditation Service T117 (EN ISO/IEC 17025)

FCC Part 15C Compliance Test Report

Test Report no.:	Salo_FCC_0724_07.doc	**Date of Report:**	06.07.2007
Number of pages:	71	**Customer's Contact person:**	Tero Huhtala
Testing laboratory:	TCC Nokia Salo Laboratory P.O. Box 86 Joensuunkatu 7H / Kiila 1B FIN-24101 SALO, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 45220	**Customer:**	Nokia Corporation P.O. Box 68 Sinitaival 5 FIN-33721 TAMPERE, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 46880
FCC listing no.: **IC recognition no.:**	533467 5385		
Tested devices/ accessories:	**Phone RM-160 / Control Unit AD-43, Headset HS-45, Battery BL-6F, Dummy Battery SD-13 and AC-Charger AC-5U**		
FCC ID:	PDNRM-160	**IC:**	661R- RM160
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:	 Digitally signed by Sami K Lehtonen DN: cn=Sami K Lehtonen, c=FI, o=Nokia, ou=CertMT Date: 2007.07.06 15:24:57 +03'00'		

Sami Lehtonen, System Manager

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	13.06.2007
Testing completed	04.07.2007
The customer's contact person	Pasi Vainio
Test Plan referred to	T:\Projects\RM-160\TestPlan_RS\RS_Testplan_RM-160.xls
Notes	-
Document name	T:\Projects\RM-160\EMC\Results\FCC\Salo_FCC_0724_07.doc

1.1. EUT and Accessory Information

The EUT is a 6-band (GSM850/900/1800/1900 and WCDMA Band II(1900)/V(850)) mobile phone with Bluetooth and WLAN. Bluetooth and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-160	004400/82/172012/3	4000	-	V 10.2.001	12000
AC-Charger	AC-5U	3943497094090720279;0675542	-	-	-	11999
Battery	BL-6F	0000007205000100000;0670523	-	-	-	12004
Control Unit	AD-43		-	-	-	12002
Headset	HS-45	06946447156H1903135	-	-	-	12001
Phone	RM-160	004400/82/172023/0	4000	-	V 10.2.001	12025
Phone	RM-160	004400/82/172039/6	4000	-	V 10.2.001	12024
Dummy Battery	SD-13	1002309K0451	proto v0.3	-	-	12033
Control Unit	AD-43	0694575710512609167	-	-	-	12026
Headset	HS-45	06946447156H1903139	-	-	-	12027

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

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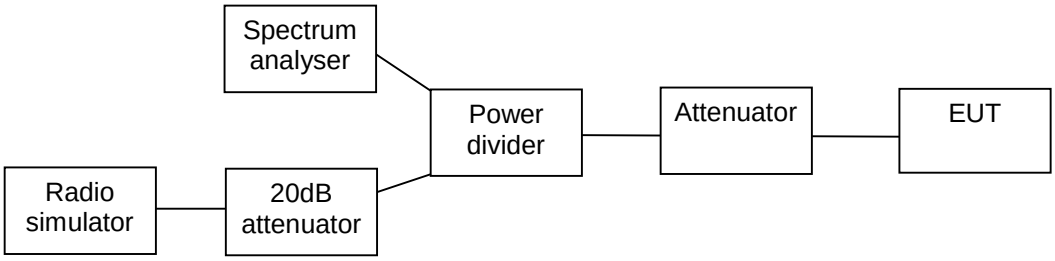
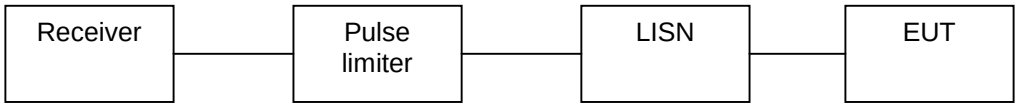
2. Test setups

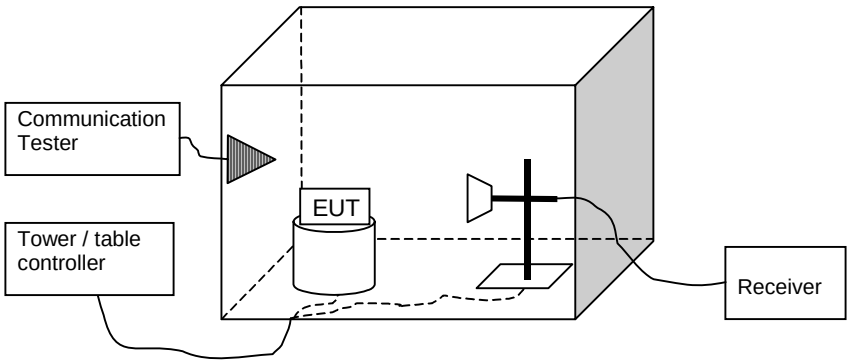
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Spurious radiated emissions test setup



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3. Conducted peak output power

(FCC §15.247(b)(1), RSS-210 A8.4 (2))

EUT with DUT number	RM-160, DUT 12024
Accessories with DUT numbers	SD-13, DUT 12033; AD-43, DUT 12026, HS-45, DUT 12027
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Phone tested slide open mode.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 42 / 101.3
Date of measurements	26.06.2007
Measured by	Jani Koskinen

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

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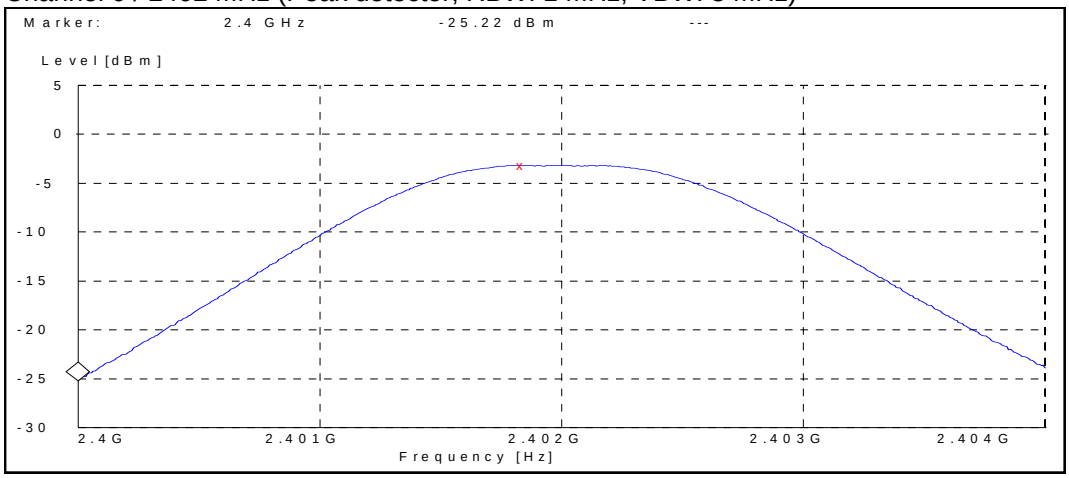
3.2. Bluetooth Test results

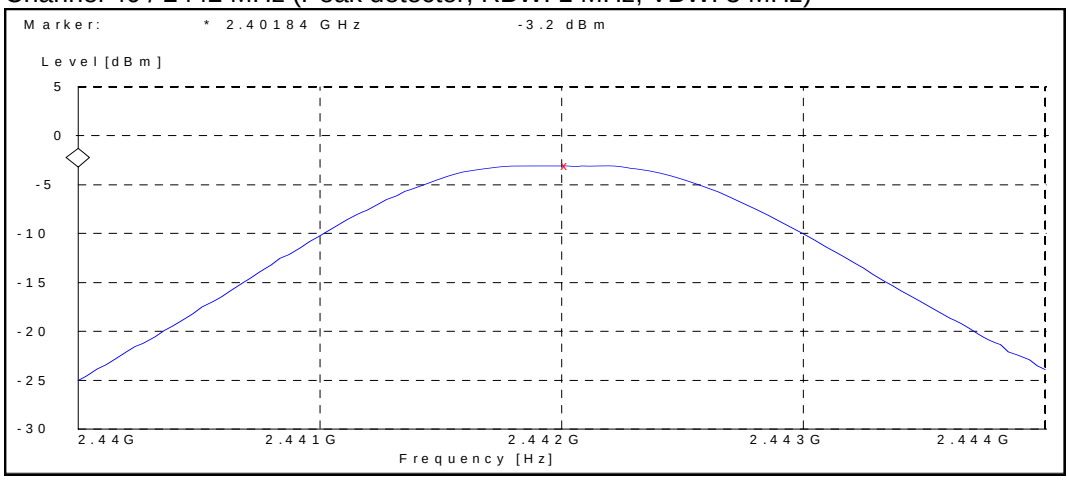
3.2.1 GFSK modulation, PRBS packet type

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
0 / 2402	-3.20	0.479	PASSED
40 / 2442	-3.00	0.501	PASSED
78 / 2480	-3.00	0.501	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)

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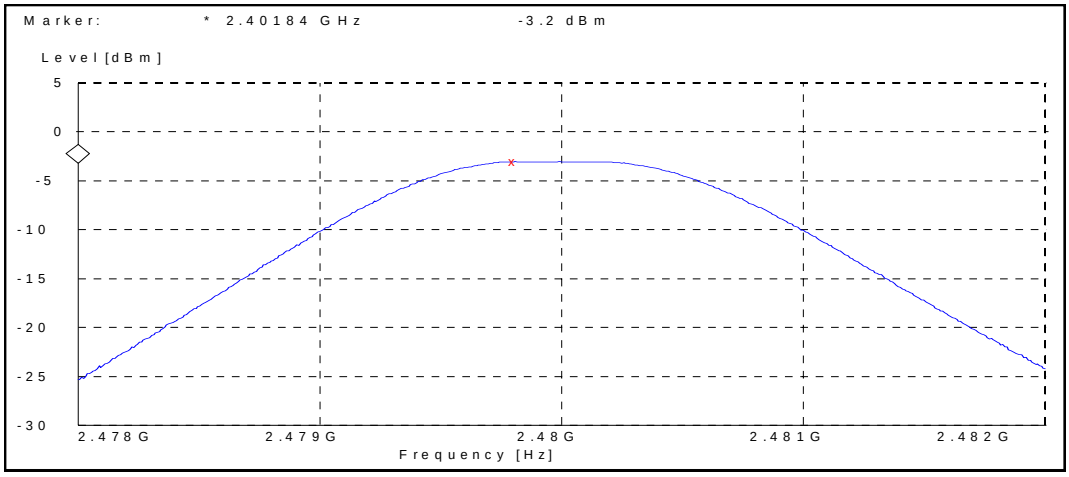
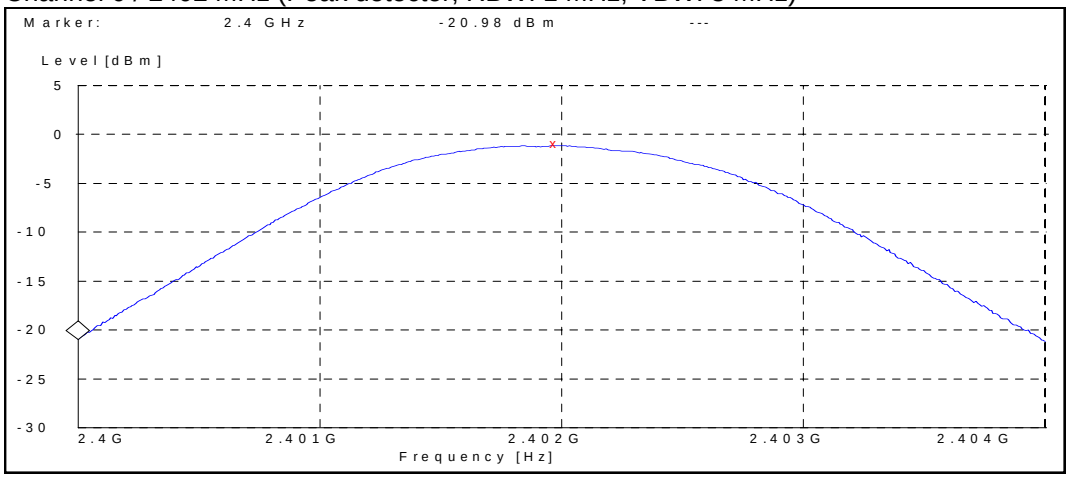


3.2.2 8DPSK modulation, PRBS packet type

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
0 / 2402	-0.90	0.813	PASSED
40 / 2442	-1.20	0.759	PASSED
78 / 2480	-1.90	0.646	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)

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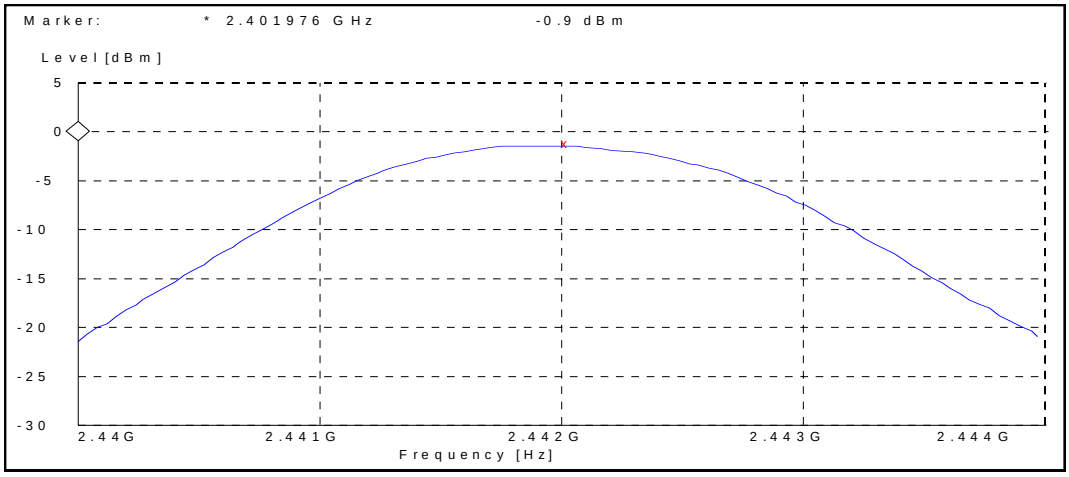
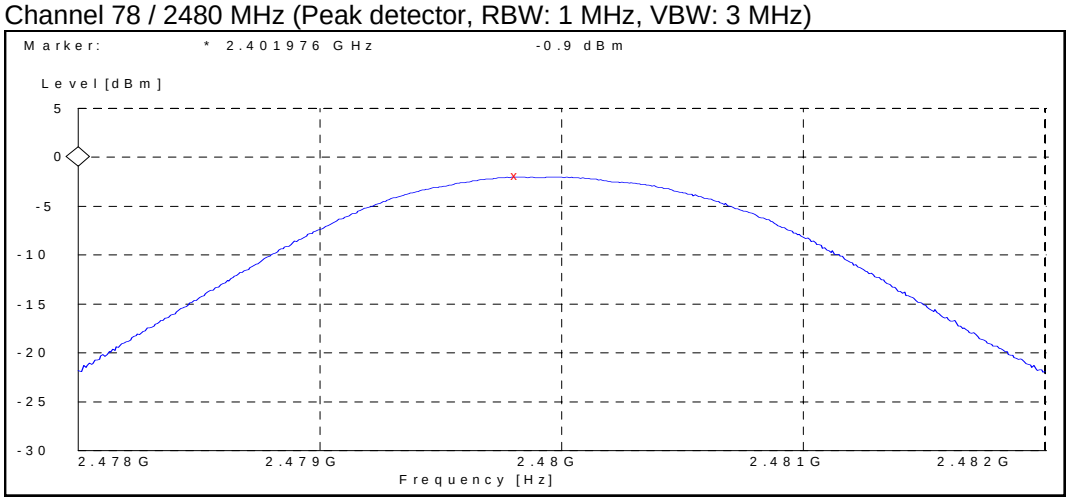


Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



3.3. WLAN Test results

3.3.1 DSSS mode, BPSK modulation, 1 Mbps data rate

Channel / f_C [MHz]	P [dBm]	P [W]	Result
1 / 2412	11.56	0.014	PASSED
7 / 2442	11.70	0.015	PASSED
11 / 2462	11.47	0.014	PASSED

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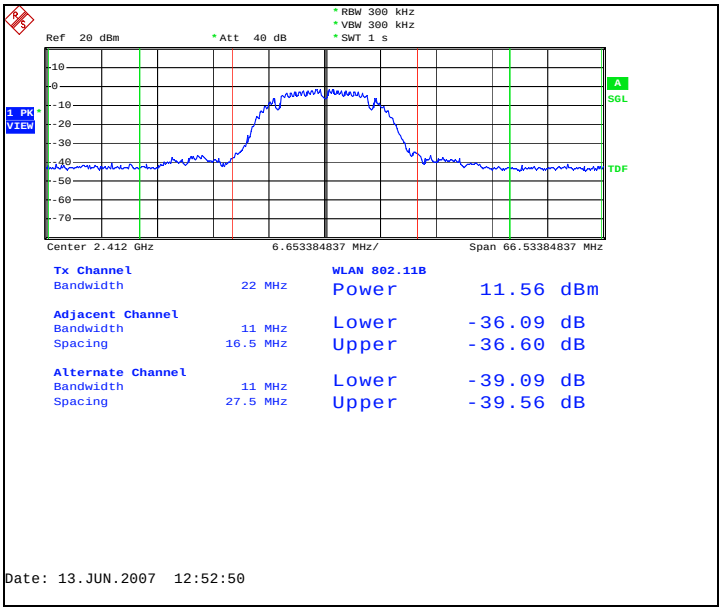
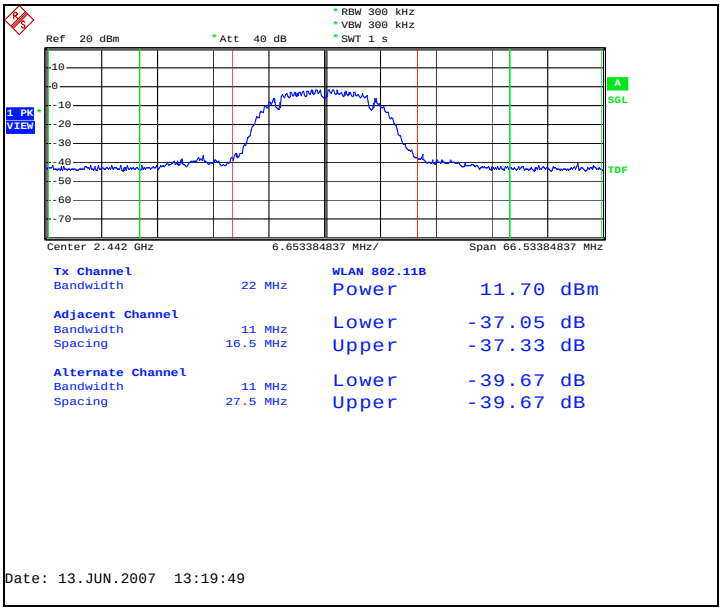
Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



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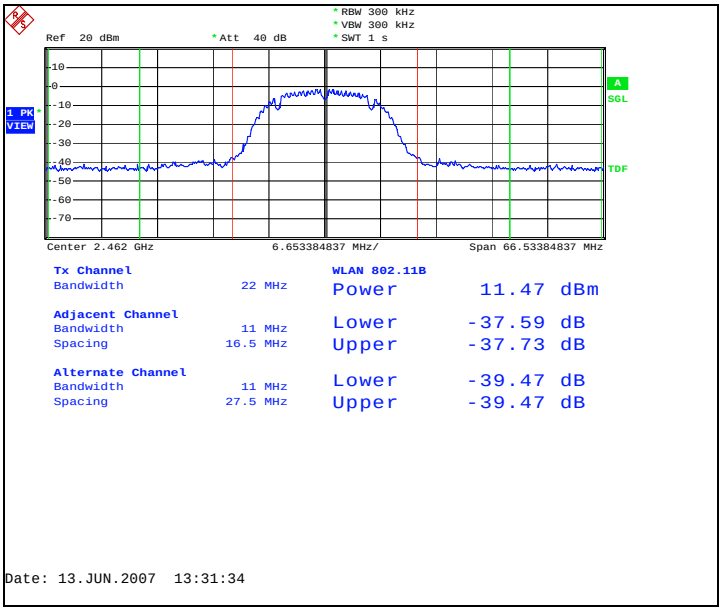
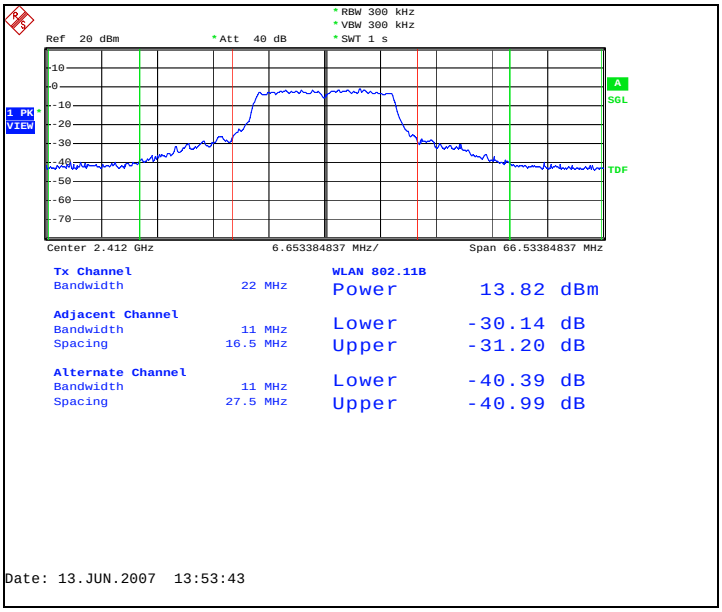
Channel 11 / 2462 MHz



3.3.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f_C [MHz]	P [dBm]	P [W]	Result
1 / 2412	13.82	0.024	PASSED
7 / 2442	13.95	0.025	PASSED
11 / 2462	13.86	0.024	PASSED

Channel 1 / 2412 MHz



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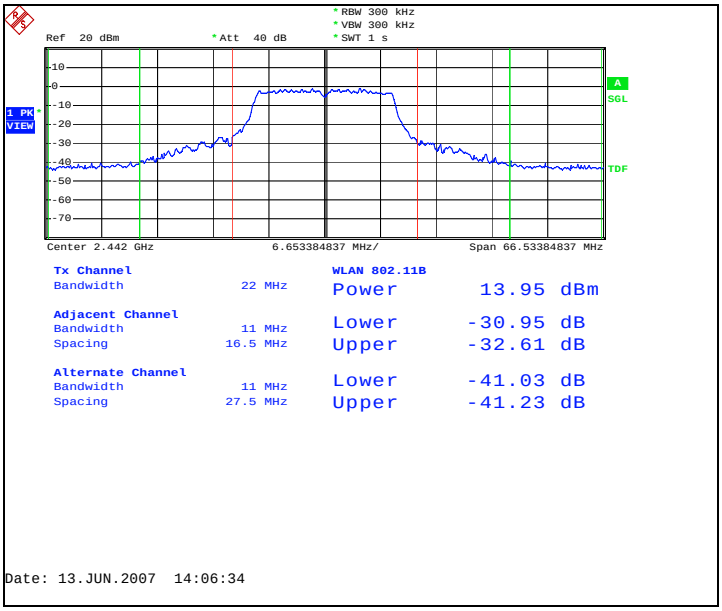
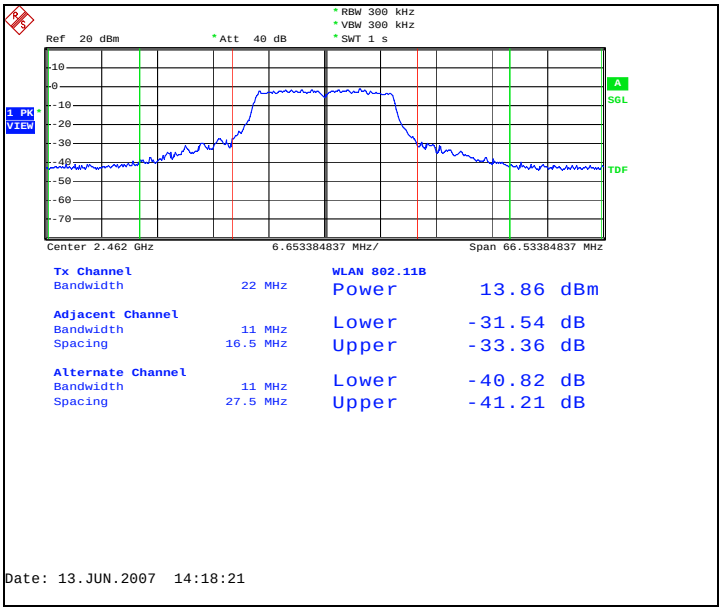
Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



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4. Band edge compliance of RF emissions

(FCC §15.247(c), RSS-210 A8.5)

EUT with DUT number	RM-160, DUT 12000
Accessories with DUT numbers	AD-43, DUT 12002; HS-45, DUT 12001; AC-5U, DUT 11999; BL-6F DUT 12004
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 41 / 101
Date of measurements	04.07.2007
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

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4.2. Bluetooth Test results

4.2.1 GFSK modulation, PRBS packet type

Slide Open:

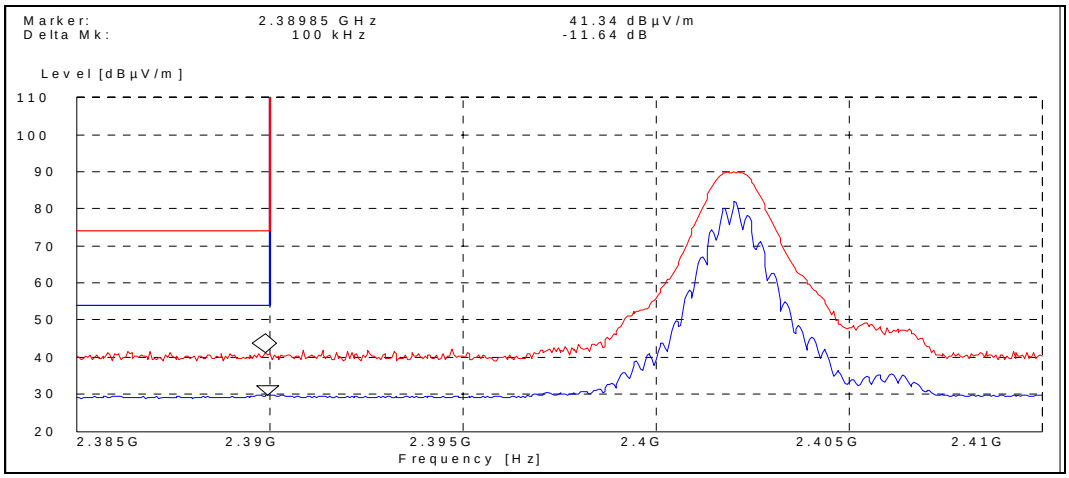
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	29.70	PASSED
78 / 2480	37.17	PASSED
Hopping on, low end	32.59	PASSED
Hopping on, high end	46.04	PASSED

Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	41.34	PASSED
78 / 2480	50.89	PASSED
Hopping on, low end	46.02	PASSED
Hopping on, high end	53.10	PASSED

Channel 0 / 2402 MHz



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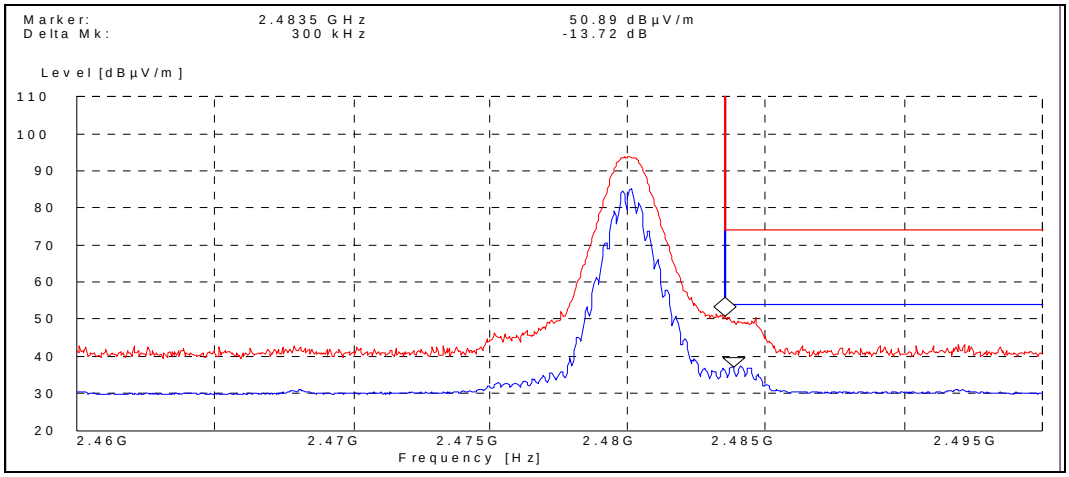
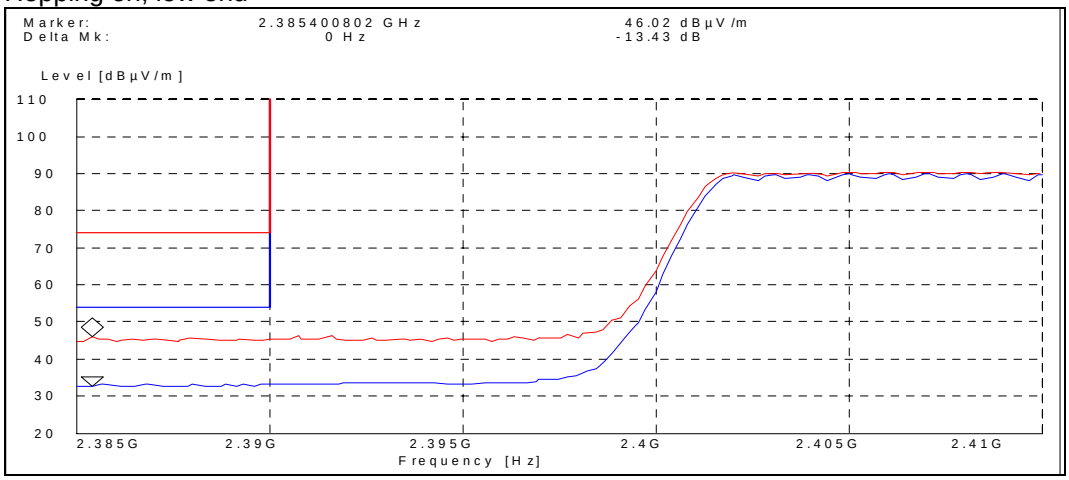
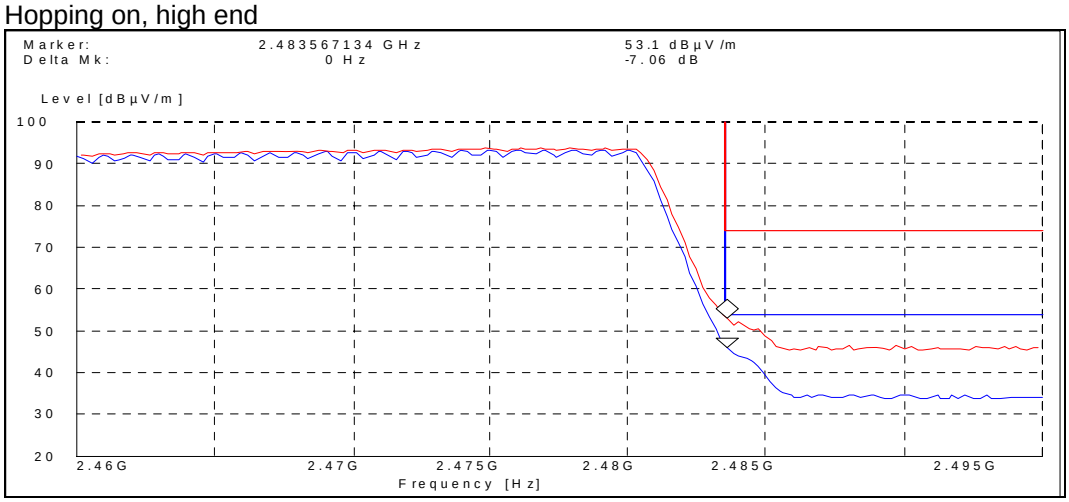
Channel 78 / 2480 MHz



Hopping on, low end



Hopping on, high end



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Slide Closed:

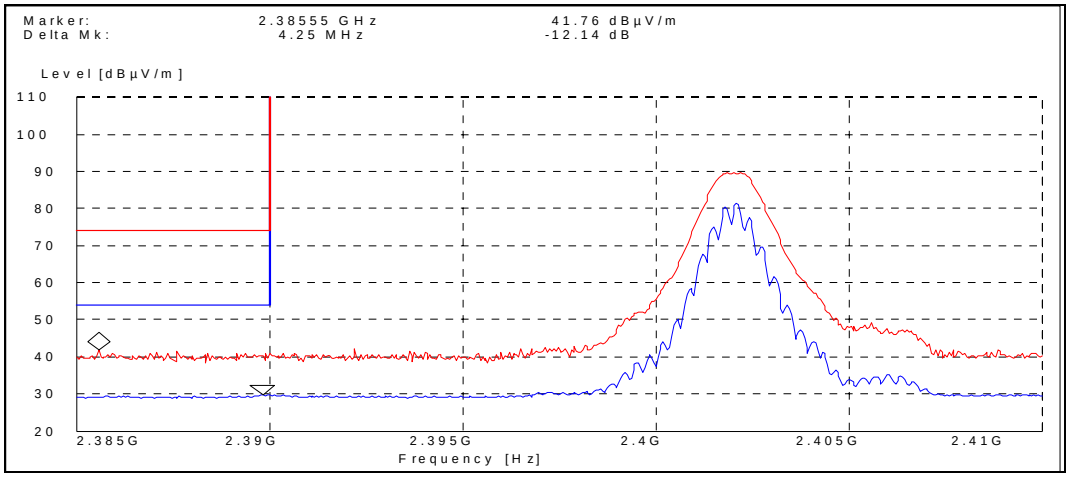
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	29.62	PASSED
78 / 2480	37.20	PASSED
Hopping on, low end	33.24	PASSED
Hopping on, high end	45.71	PASSED

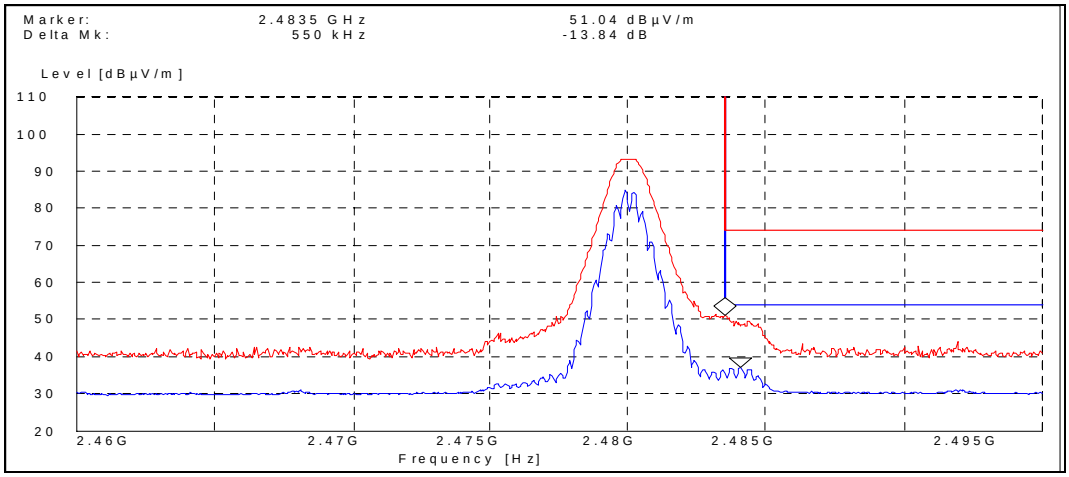
Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	41.76	PASSED
78 / 2480	51.04	PASSED
Hopping on, low end	56.44	PASSED
Hopping on, high end	52.51	PASSED

Channel 0 / 2402 MHz



Channel 78 / 2480 MHz



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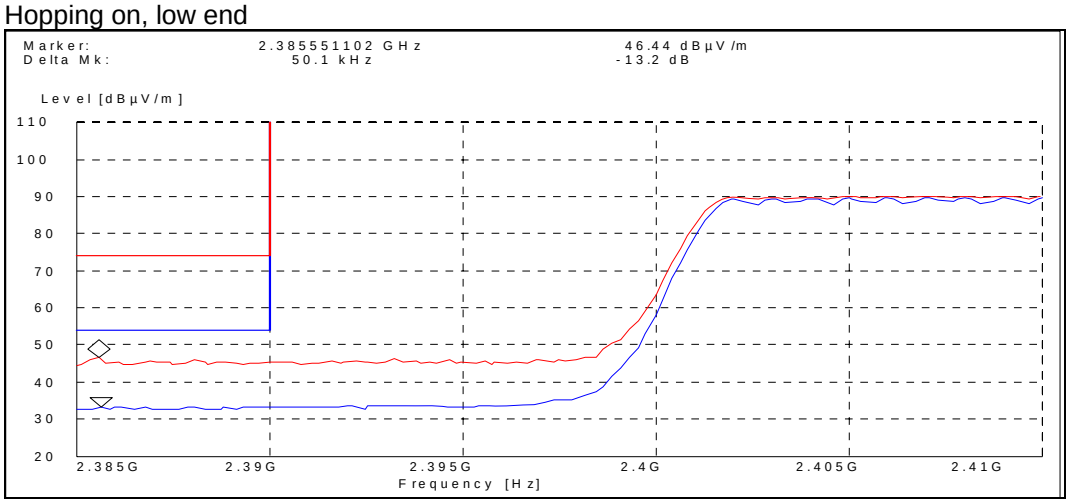
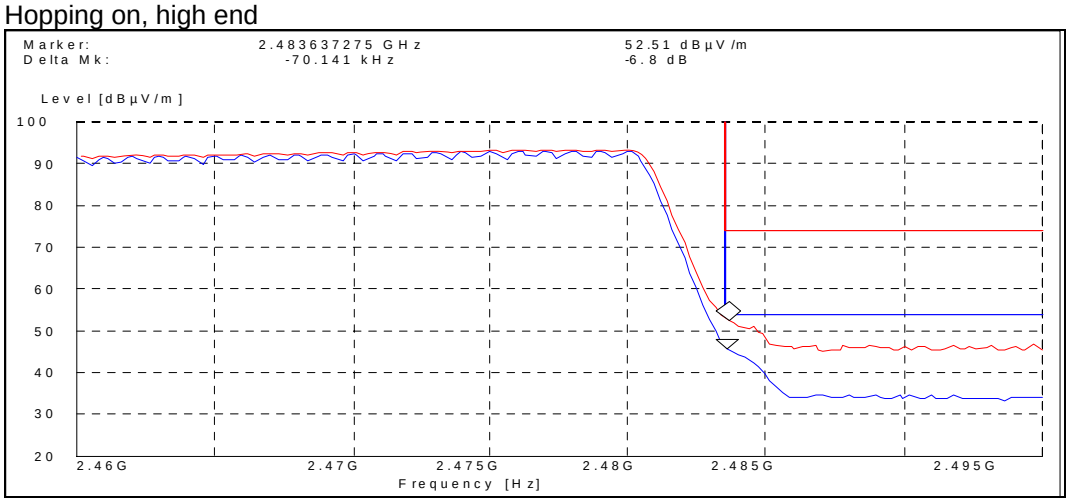
Hopping on, low end



Hopping on, high end



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4.2.2 8DPSK modulation, PRBS packet type

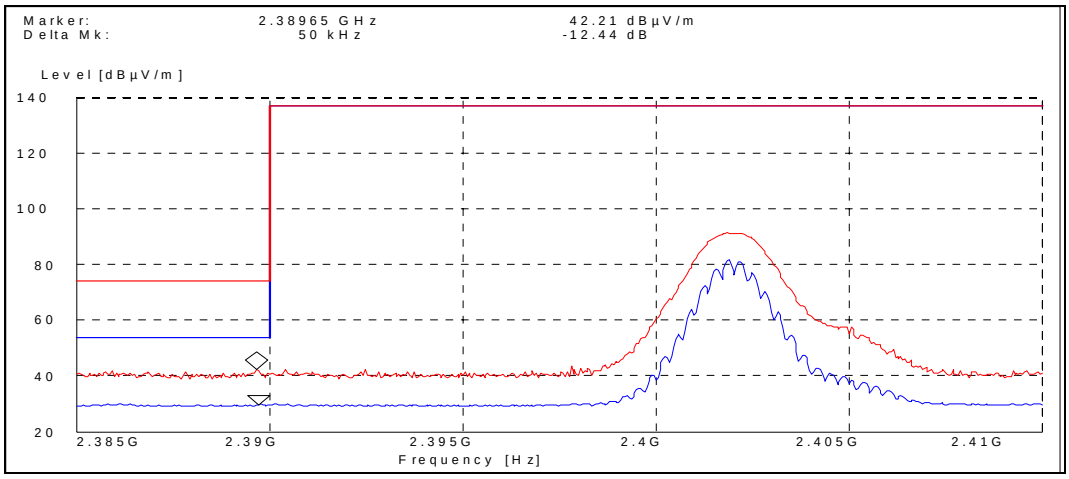
Slide Open:
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	29.77	PASSED
78 / 2480	39.03	PASSED
Hopping on, low end	33.94	PASSED
Hopping on, high end	47.87	PASSED

Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	42.21	PASSED
78 / 2480	56.16	PASSED
Hopping on, low end	45.22	PASSED
Hopping on, high end	57.20	PASSED

Channel 0 / 2402 MHz



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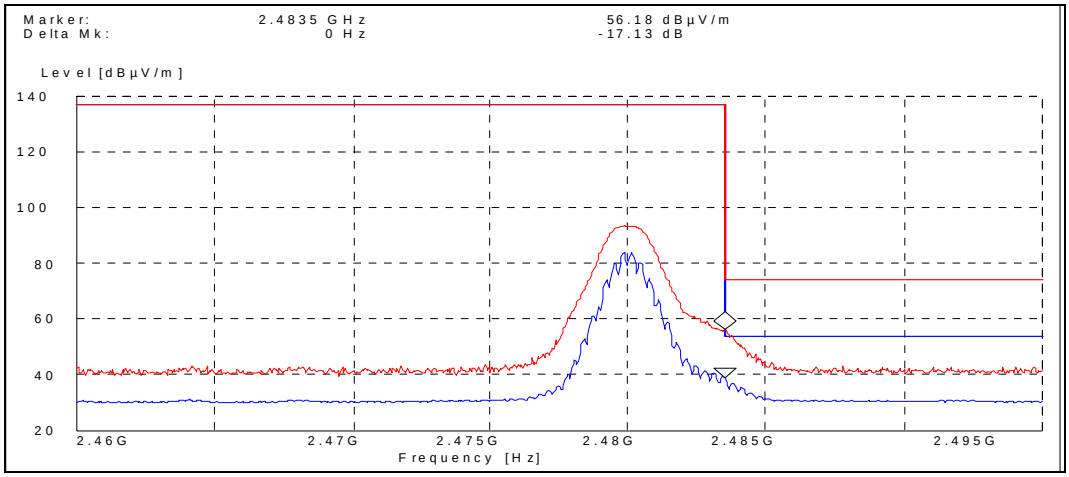
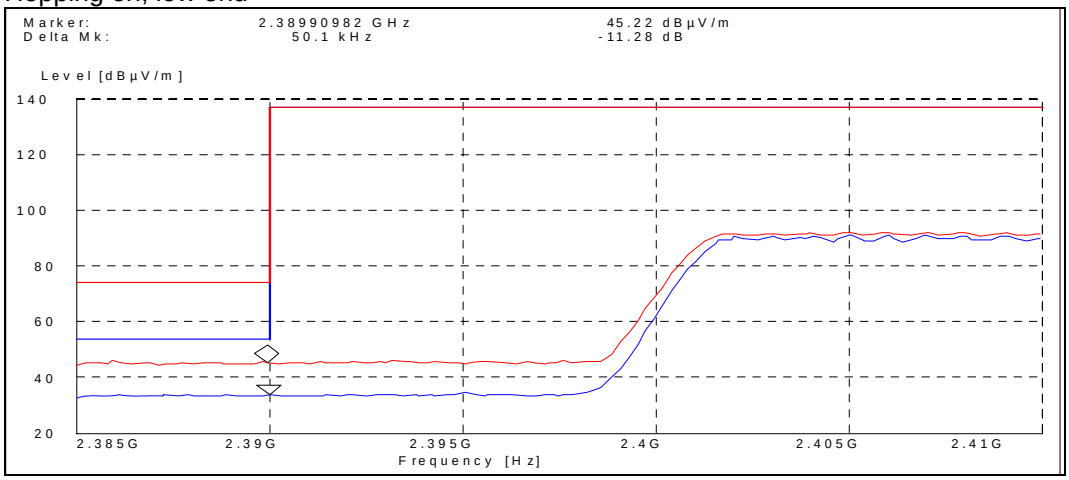
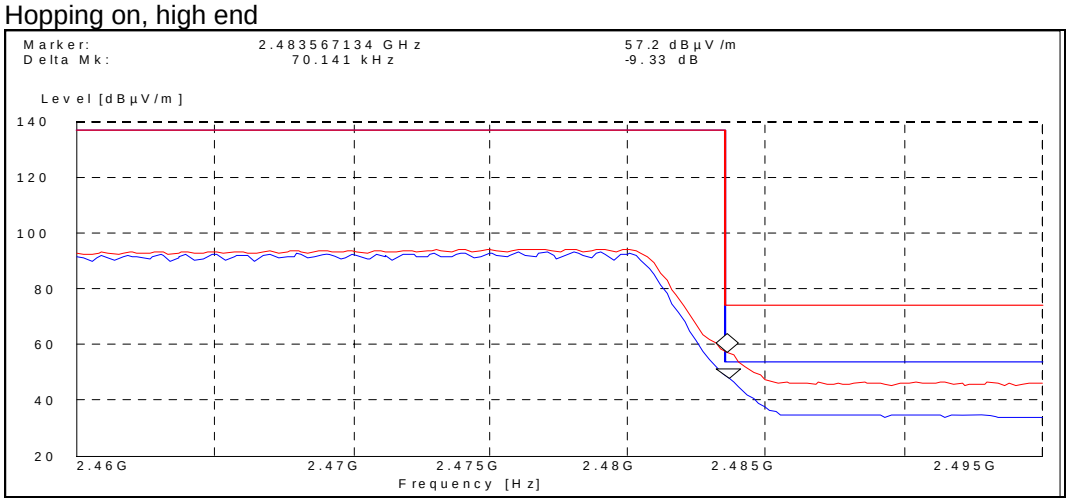
Channel 78 / 2480 MHz



Hopping on, low end



Hopping on, high end



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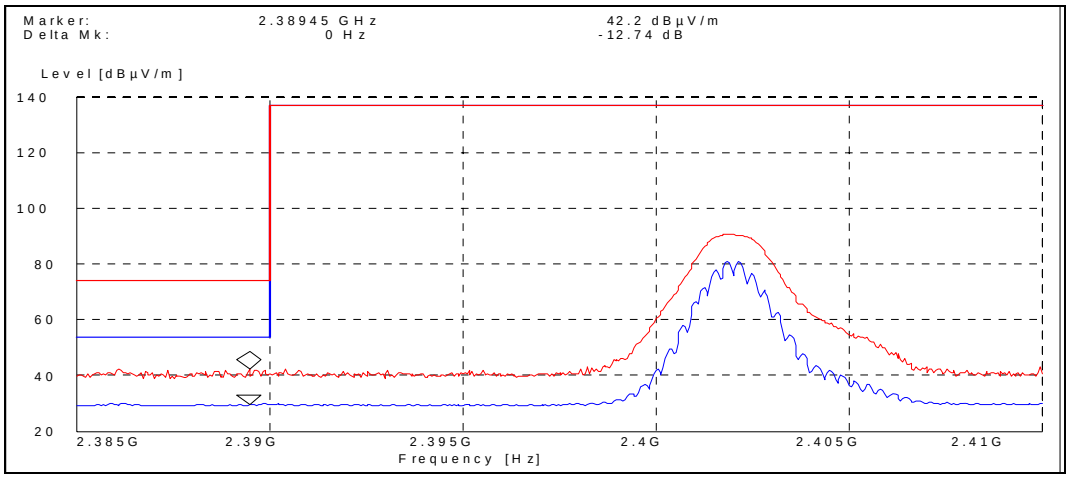
Slide Closed:
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	29.46	PASSED
78 / 2480	38.42	PASSED
Hopping on, low end	33.87	PASSED
Hopping on, high end	48.26	PASSED

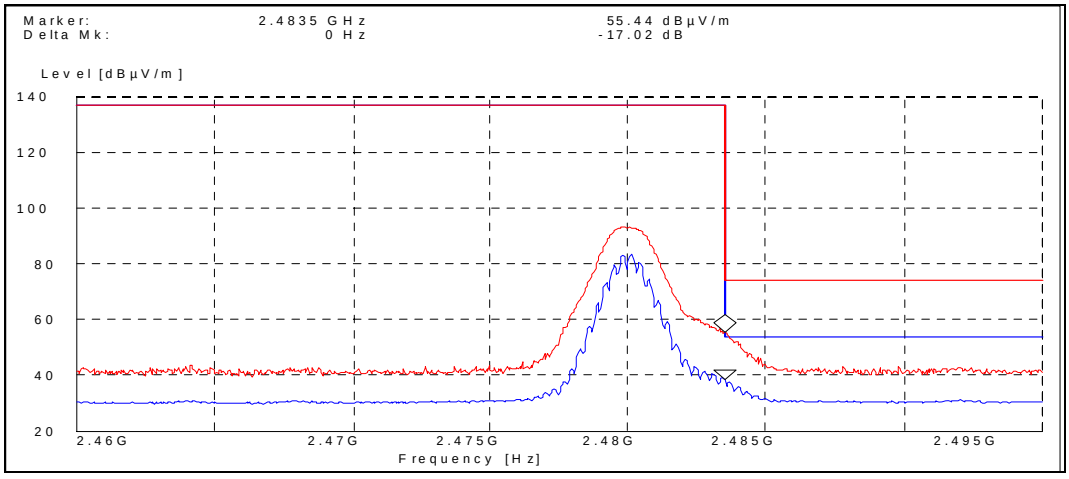
Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	42.20	PASSED
78 / 2480	55.44	PASSED
Hopping on, low end	46.20	PASSED
Hopping on, high end	58.04	PASSED

Channel 0 / 2402 MHz



Channel 78 / 2480 MHz



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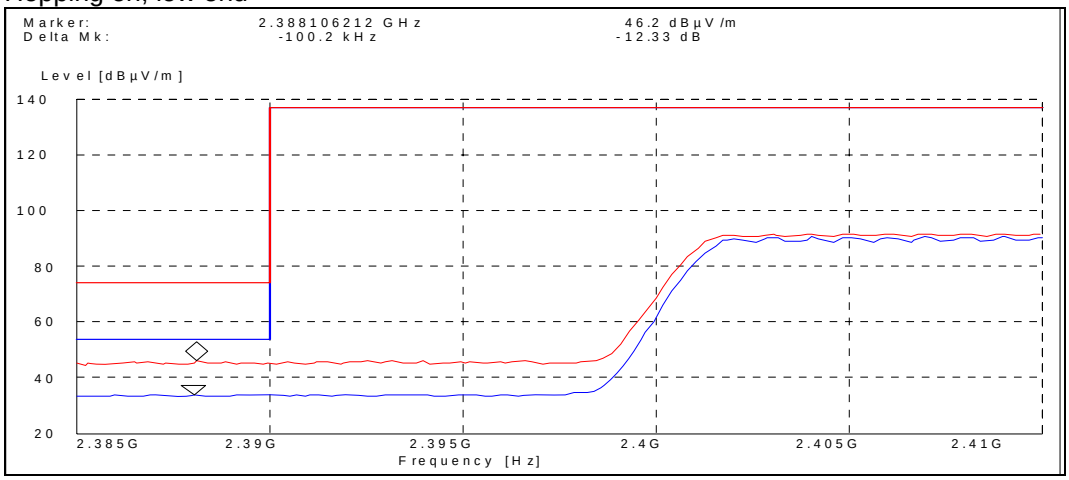
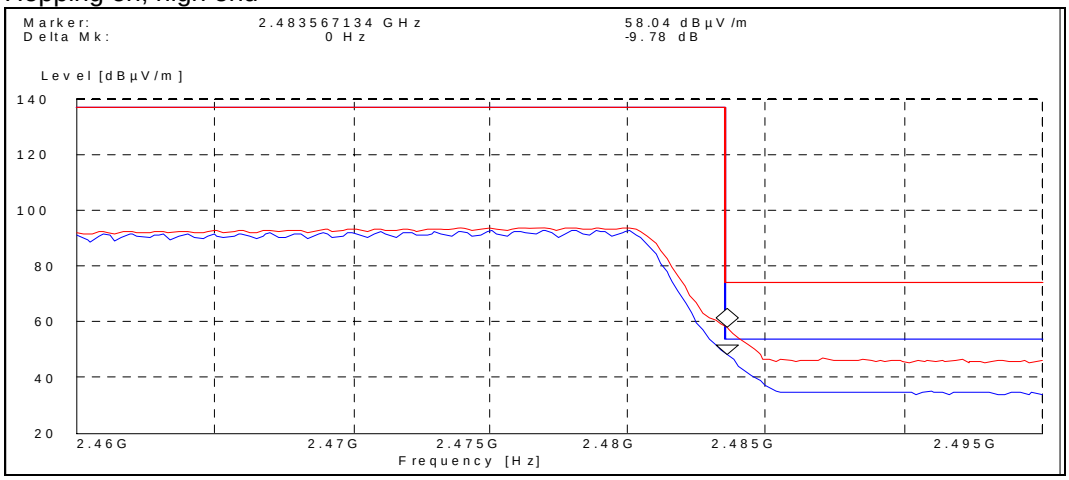
Hopping on, low end



Hopping on, high end



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4.3. WLAN Test results

4.3.1 DSSS mode, BPSK modulation, 1 Mbps data rate

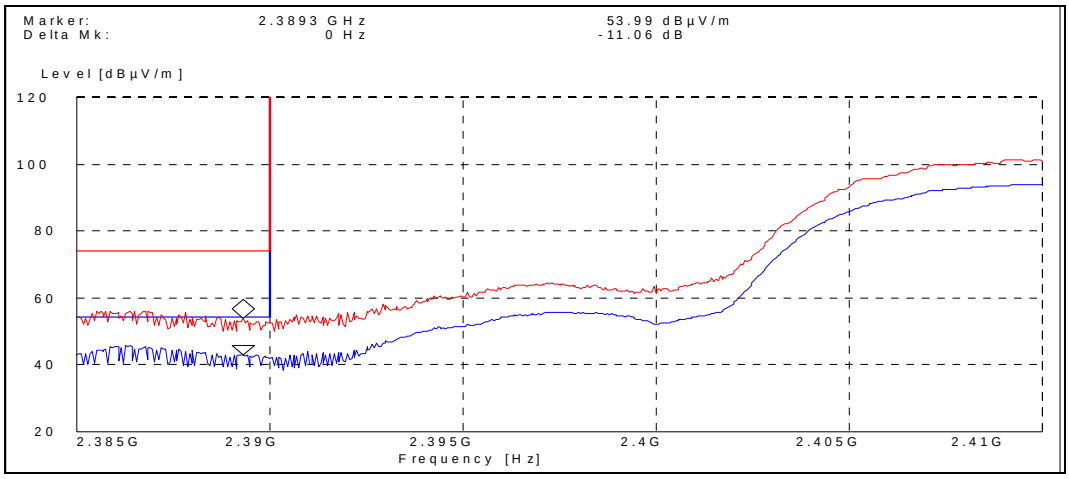
Slide Open:
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
1 / 2412	42.93	PASSED
11 / 2462	42.32	PASSED

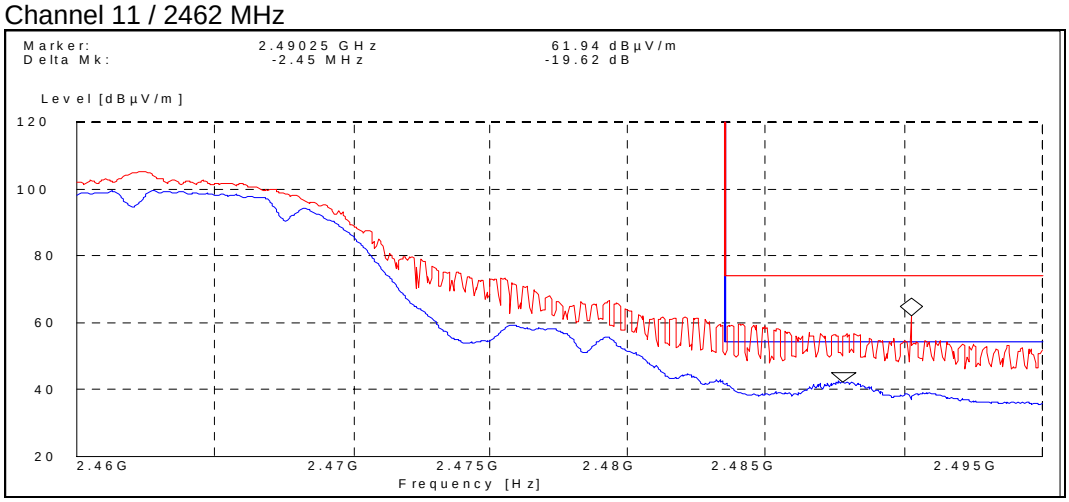
Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
1 / 2412	53.99	PASSED
11 / 2462	61.94	PASSED

Channel 1 / 2412 MHz



Channel 11 / 2462 MHz



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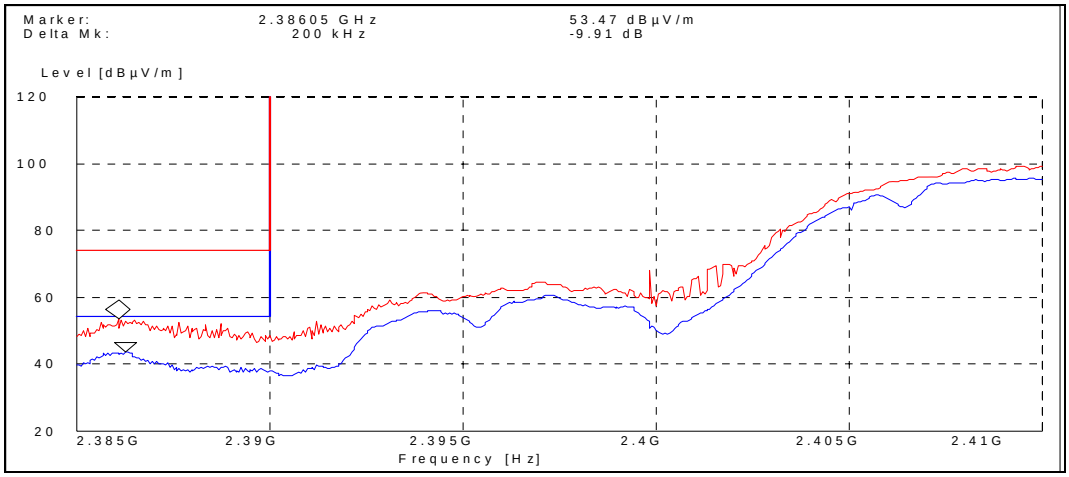
Slide Closed:
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
1 / 2412	43.56	PASSED
11 / 2462	43.38	PASSED

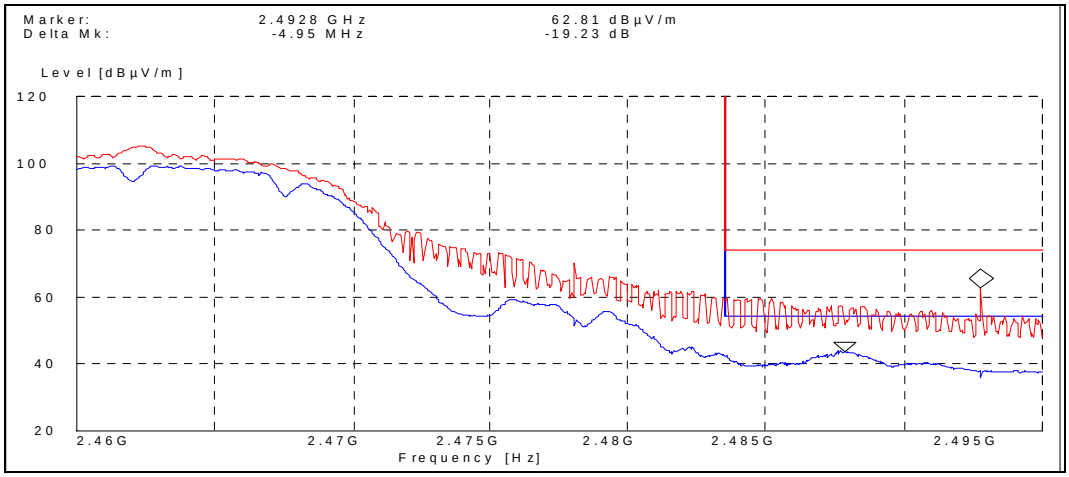
Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
1 / 2412	53.47	PASSED
11 / 2462	62.81	PASSED

Channel 1 / 2412 MHz



Channel 11 / 2462 MHz



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4.3.2 OFDM mode, BPSK modulation, 6 Mbps data rate

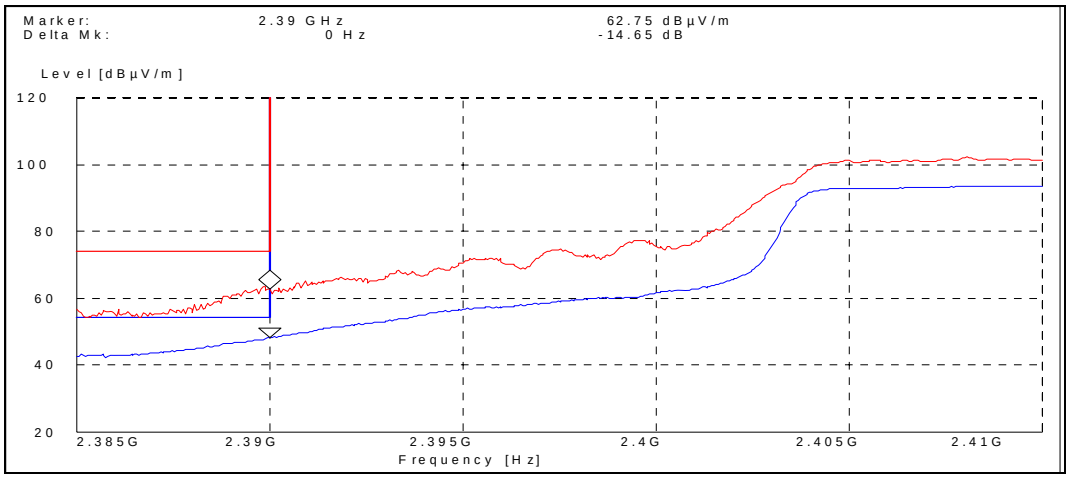
Slide Open:
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
1 / 2412	48.10	PASSED
11 / 2462	44.76	PASSED

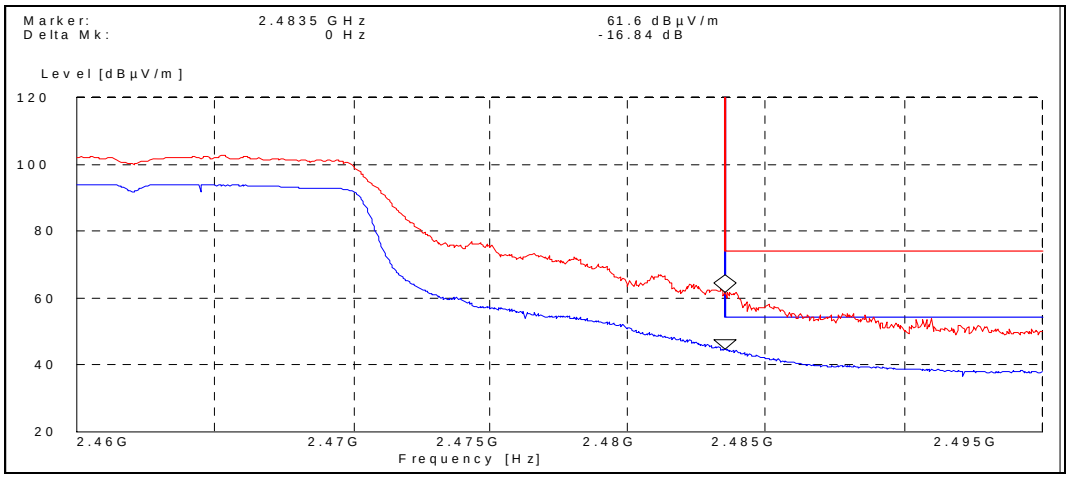
Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
1 / 2412	62.75	PASSED
11 / 2462	61.60	PASSED

Channel 1 / 2412 MHz



Channel 11 / 2462 MHz



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Slide Closed:

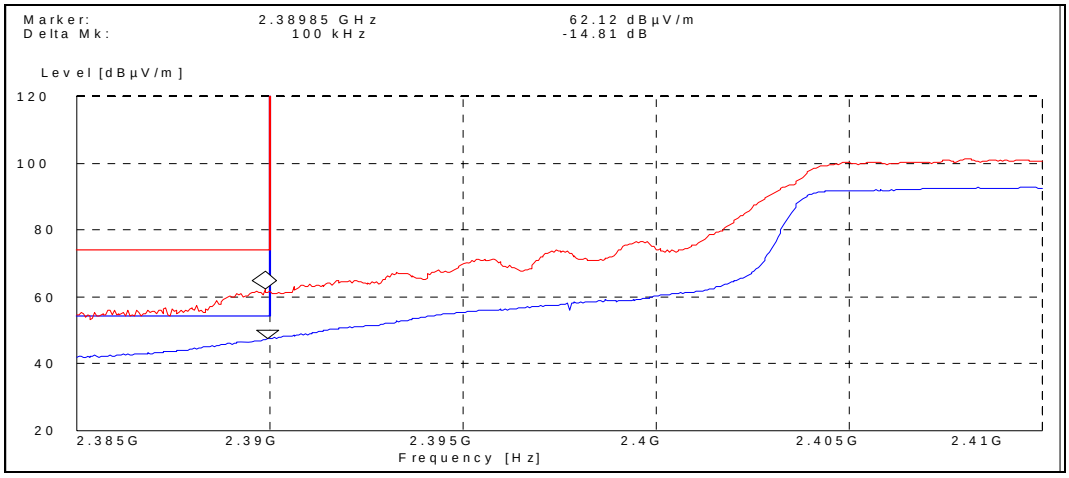
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
1 / 2412	47.31	PASSED
11 / 2462	45.80	PASSED

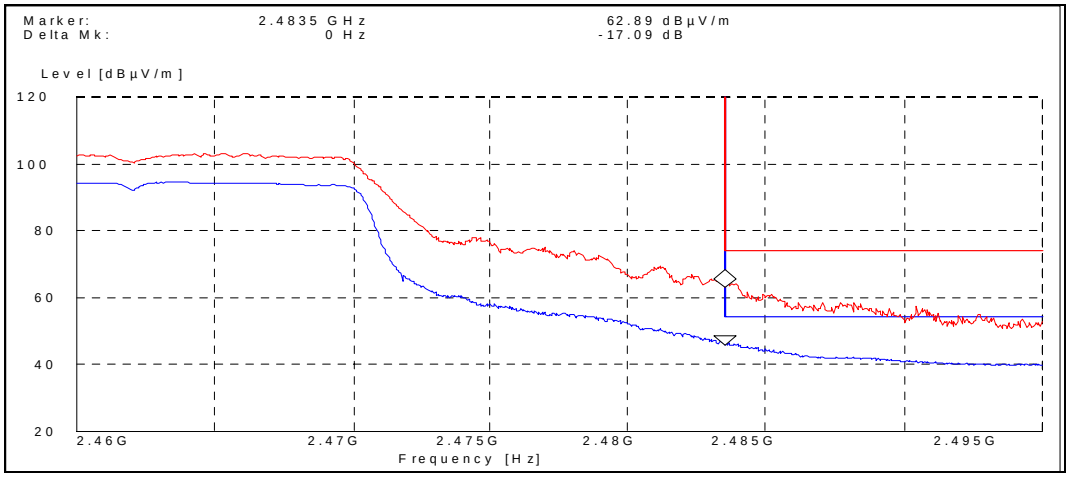
Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
1 / 2412	62.12	PASSED
11 / 2462	62.89	PASSED

Channel 1 / 2412 MHz



Channel 11 / 2462 MHz



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5. Spurious RF conducted emissions

(FCC §15.247(c), RSS-A8.5)

EUT with DUT number	RM-160, DUT 12024
Accessories with DUT numbers	SD-13, DUT 12033; AD-43, DUT 12026, HS-45, DUT 12027
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Phone tested slide open mode.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 42 / 101.3
Date of measurements	26.06.2007
Measured by	Jani Koskinen

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

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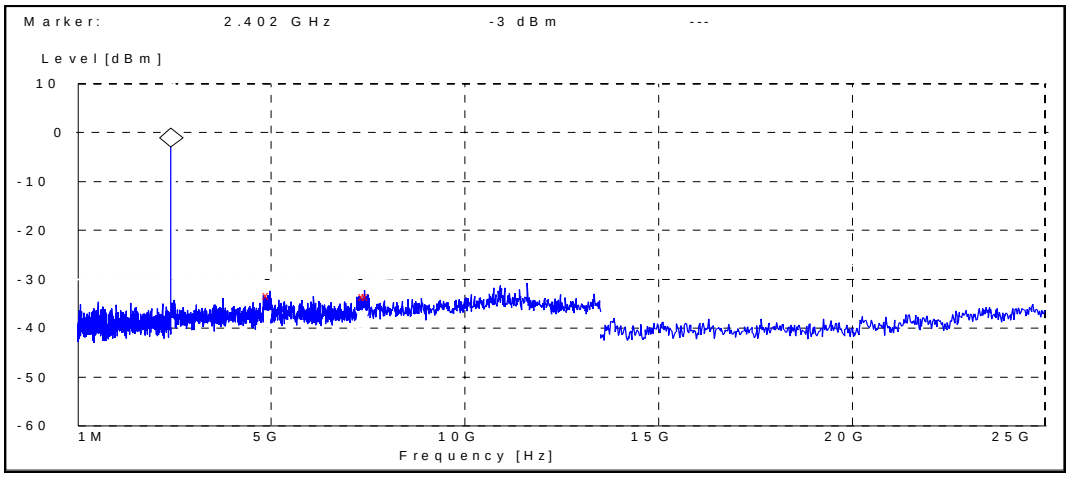
5.2. Bluetooth Test results

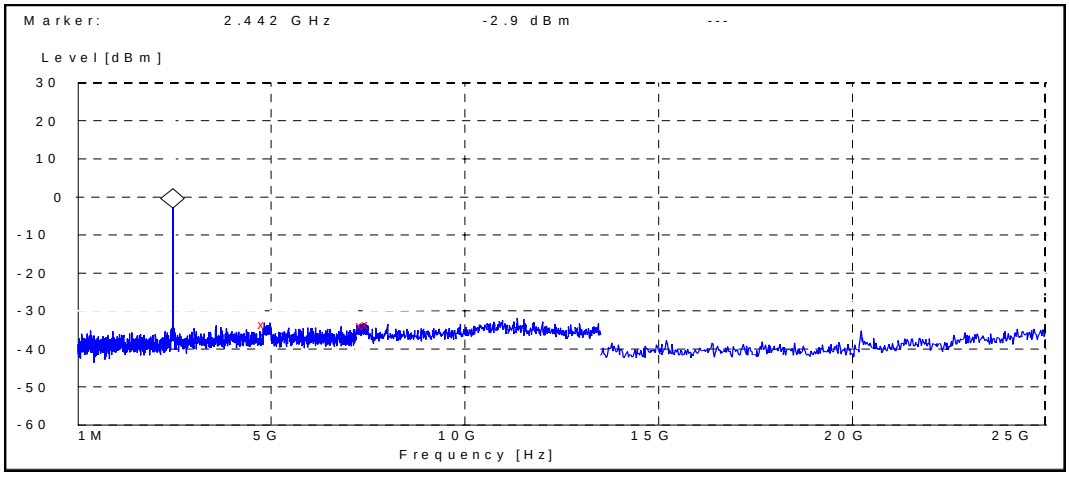
5.2.1 GFSK modulation, PRBS packet type

Channel 0 / 2402 MHz



Frequency [MHz]	P [dBc]	Result
4952.800000	-30.397961	PASSED
7402.800000	-30.597961	PASSED
7500.000000	-30.497961	PASSED

Channel 40 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4817.200000	-30.695496	PASSED
7374.000000	-31.095496	PASSED
7500.000000	-30.695496	PASSED

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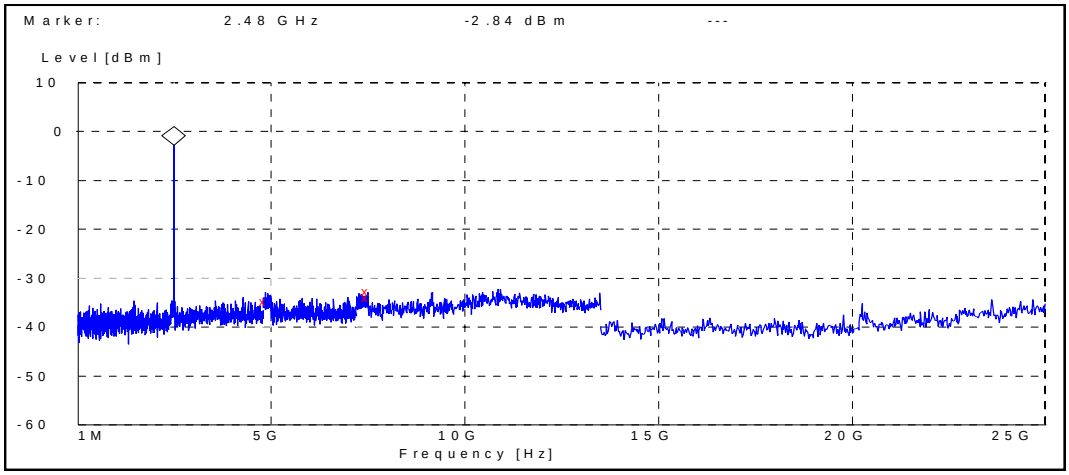
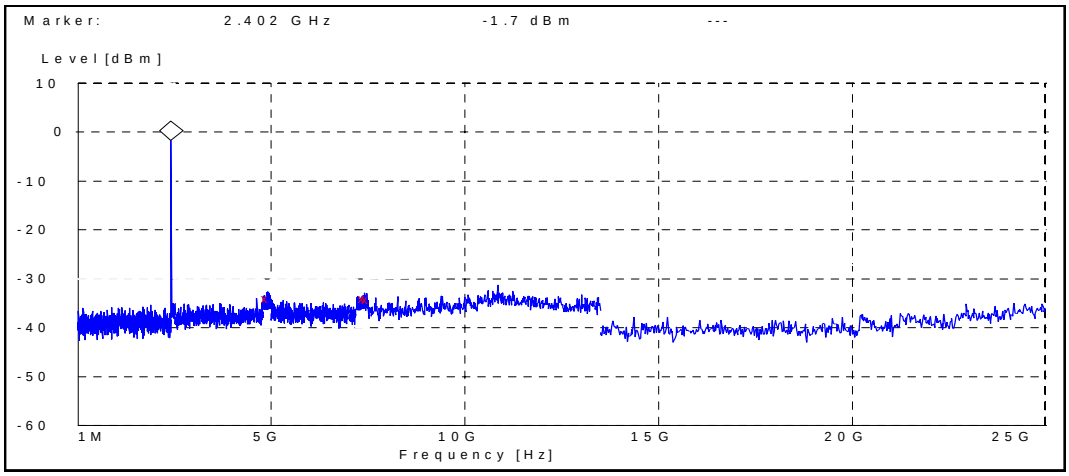
Channel 78 / 2480 MHz



Frequency [MHz]	P [dBc]	Result
4850.400000	-31.958041	PASSED
7497.000000	-29.758041	PASSED
7500.000000	-31.158041	PASSED

5.2.2 8DPSK modulation, PRBS packet type

Channel 0 / 2402 MHz



Frequency [MHz]	P [dBc]	Result
4905.200000	-32.302451	PASSED
7403.400000	-32.302451	PASSED
7500.000000	-32.502451	PASSED

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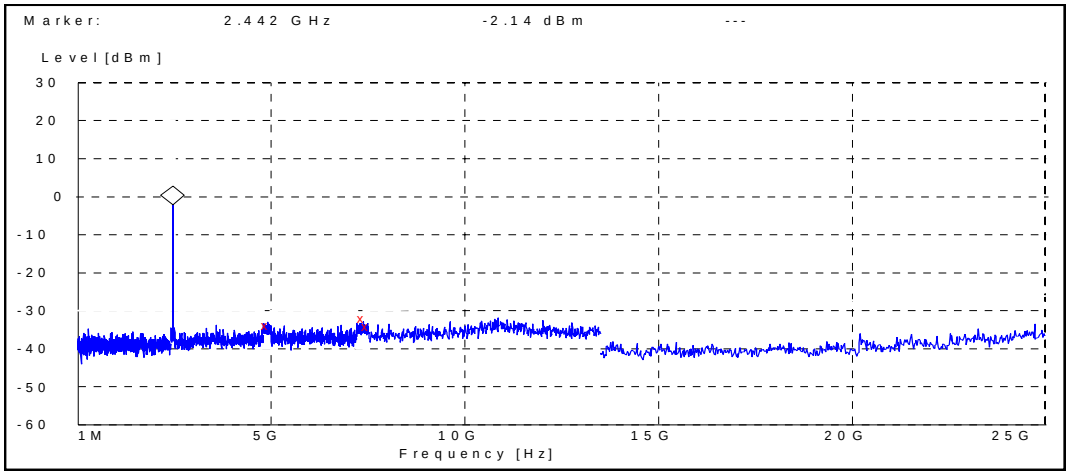
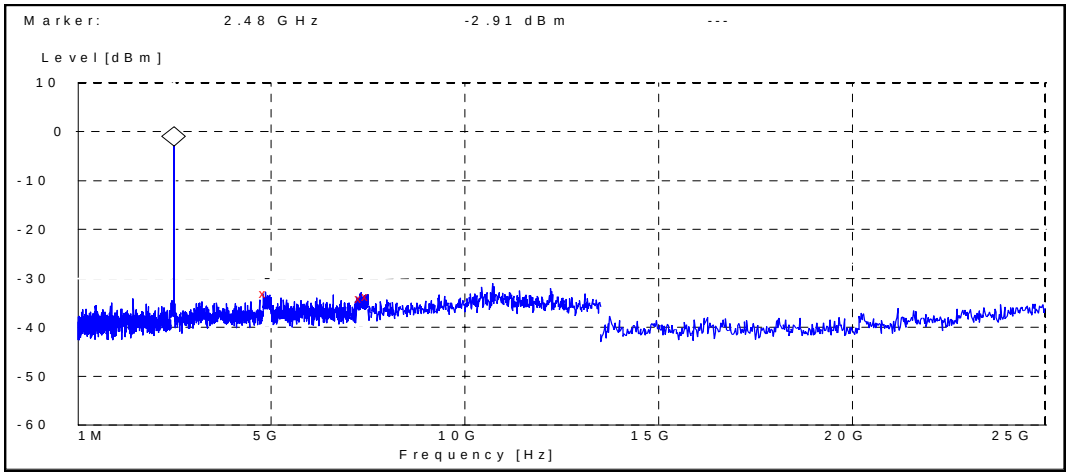
Channel 40 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4906.400000	-31.857581	PASSED
7380.600000	-29.757581	PASSED
7500.000000	-31.957581	PASSED

Channel 78 / 2480 MHz



Frequency [MHz]	P [dBc]	Result
4857.200000	-30.194046	PASSED
7328.400000	-31.194046	PASSED
7500.000000	-30.694046	PASSED

5.3. WLAN Test results

5.3.1 DSSS mode, BPSK modulation, 1 Mbps data rate

Channel 1 / 2412 MHz

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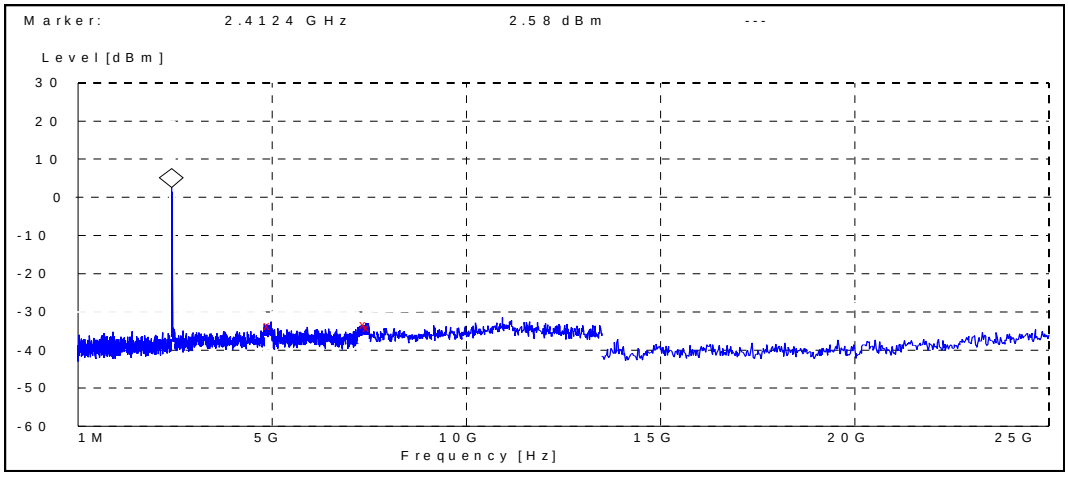
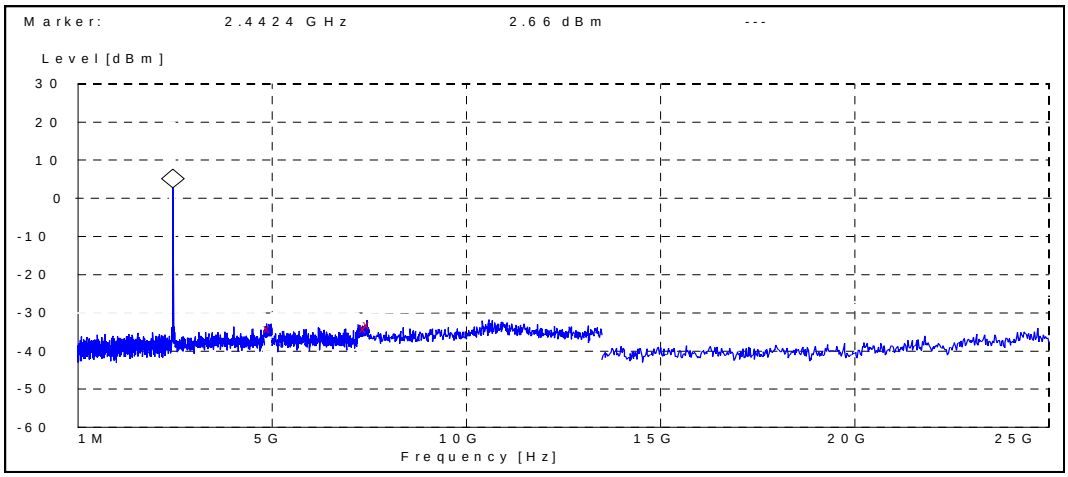


Frequency [MHz]	P [dBc]	Result
4962.800000	-36.180000	PASSED
7438.200000	-35.980000	PASSED
7500.000000	-36.580000	PASSED

Channel 7 / 2442 MHz



Frequency [MHz]	P [dBc]	Result
4967.200000	-36.659666	PASSED
7437.600000	-36.759666	PASSED
7500.000000	-35.659666	PASSED

Channel 11 / 2462 MHz

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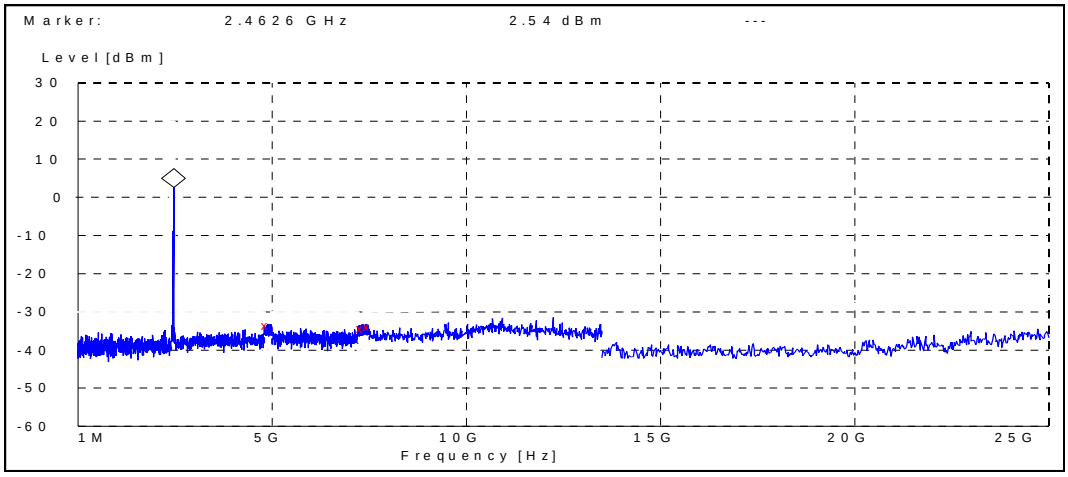
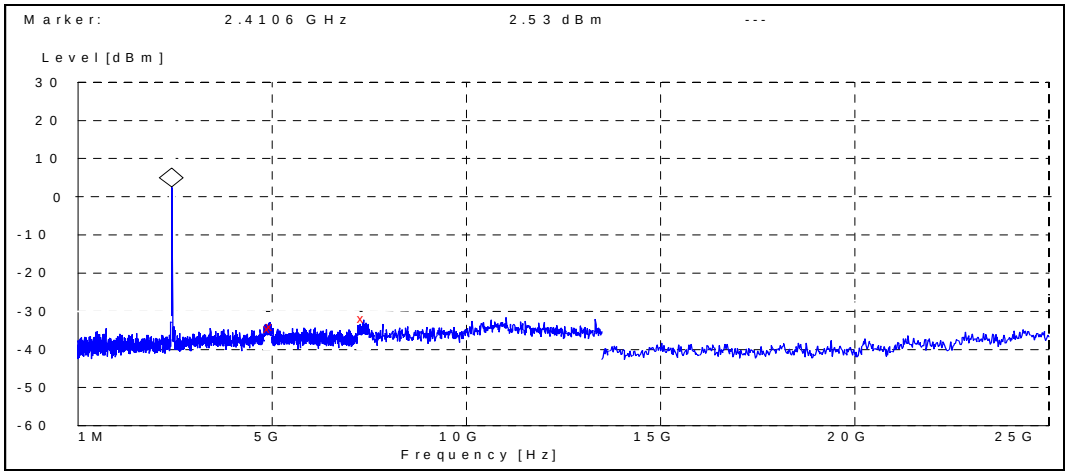


Frequency [MHz]	P [dBc]	Result
4900.800000	-36.037993	PASSED
7322.400000	-36.937993	PASSED
7500.000000	-36.337993	PASSED

5.3.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 1 / 2412 MHz



Frequency [MHz]	P [dBc]	Result
4944.000000	-36.928647	PASSED
5000.000000	-36.528647	PASSED
7354.800000	-34.528647	PASSED

Channel 7 / 2442 MHz

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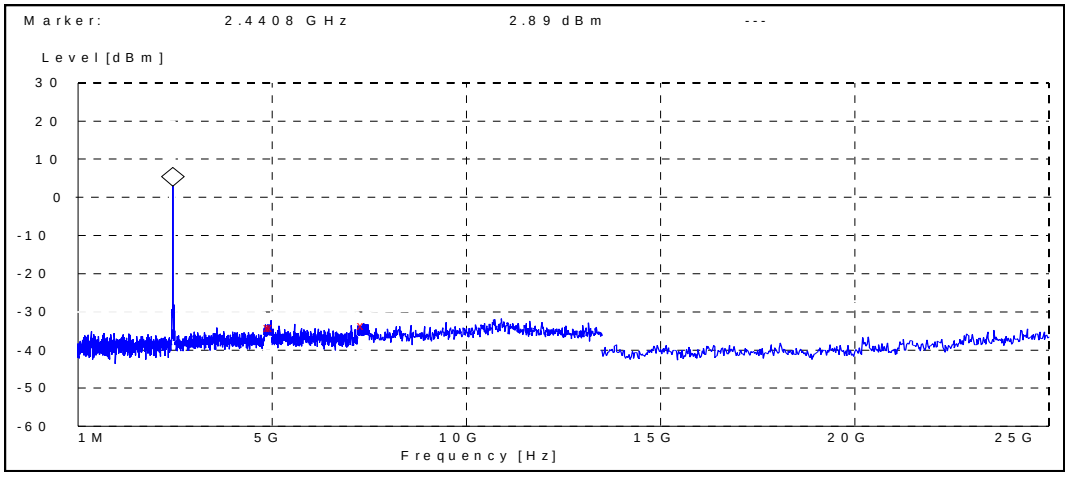
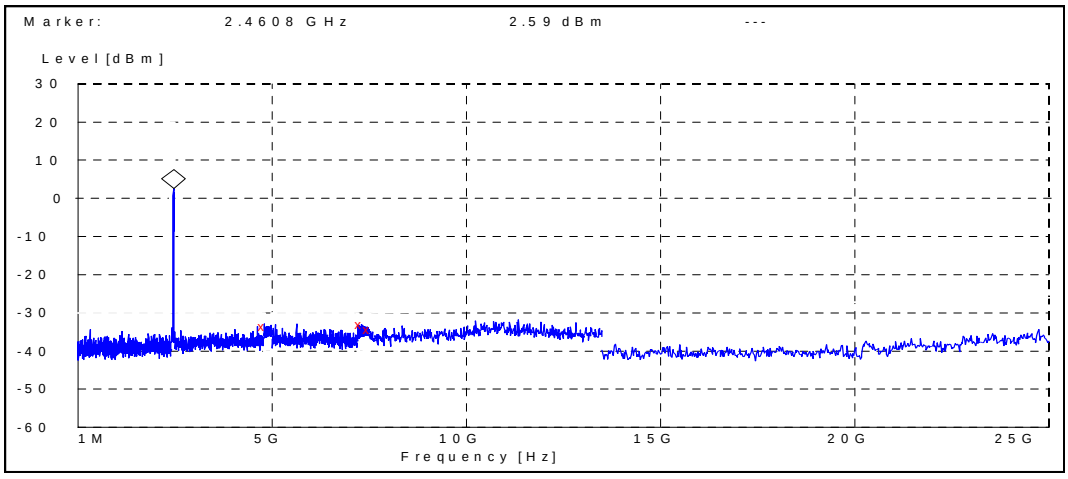


Frequency [MHz]	P [dBc]	Result
4959.200000	-36.994675	PASSED
5000.000000	-36.994675	PASSED
7369.200000	-36.394675	PASSED

Channel 11 / 2462 MHz



Frequency [MHz]	P [dBc]	Result
4800.400000	-36.290308	PASSED
7300.800000	-35.590308	PASSED
7500.000000	-36.890308	PASSED

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

EUT with DUT number	RM-160, DUT 12000
Accessories with DUT numbers	AD-43, DUT 12002; HS-45, DUT 12001; AC-5U, DUT 11999; BL-6F DUT 12004
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Phone tested slide open mode.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 41 / 101
Date of measurements	26.06.2007
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-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 ($A_{TOT} = L_{CABLES} + AF - G_{PREAMP}$).

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Limits for spurious radiated emissions measurements (3 m measurement distance)

Frequency range [MHz[	Limit [µV/m]	Limit [dBµV/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 [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4804.000000	43.60	151.36	43.10	0.5	HORIZONTAL	PASSED
7206.000000	47.20	229.09	44.50	2.7	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
4804.000000	30.80	34.67	30.30	0.5	VERTICAL	PASSED
7206.000000	33.50	47.32	30.80	2.7	HORIZONTAL	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
37.595391	25.10	17.99	43.50	-18.4	VERTICAL	PASSED
65.891182	16.80	6.92	46.80	-30.0	HORIZONTAL	PASSED
75.048497	15.60	6.03	43.30	-27.7	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
4834.167335	44.30	164.06	43.40	0.9	VERTICAL	PASSED
7337.673347	46.90	221.31	43.70	3.2	VERTICAL	PASSED
13358.717435	52.10	402.72	39.70	12.4	VERTICAL	PASSED
14489.473948	52.80	436.52	39.00	13.8	HORIZONTAL	PASSED
15456.911824	53.70	484.17	37.90	15.8	VERTICAL	PASSED
15899.291583	54.80	549.54	37.60	17.2	HORIZONTAL	PASSED
16163.330661	55.70	609.54	38.10	17.6	HORIZONTAL	PASSED
17893.287575	57.10	716.14	39.10	18.0	VERTICAL	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4836.667335	31.20	36.31	30.30	0.9	VERTICAL	PASSED
7333.173347	34.40	52.48	31.30	3.1	VERTICAL	PASSED
13360.217435	39.80	97.72	27.40	12.4	VERTICAL	PASSED
14482.973948	39.80	97.72	25.90	13.9	HORIZONTAL	PASSED
15452.411824	40.60	107.15	24.80	15.8	VERTICAL	PASSED
15898.791583	41.90	124.45	24.70	17.2	HORIZONTAL	PASSED
16168.830661	42.60	134.90	24.90	17.7	HORIZONTAL	PASSED
17891.787575	43.10	142.89	25.10	18.0	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	43.40	147.91	43.80	-0.4	HORIZONTAL	PASSED
7440.000000	47.30	231.74	43.60	3.7	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	29.90	31.26	30.30	-0.4	HORIZONTAL	PASSED
7440.000000	34.70	54.33	31.00	3.7	VERTICAL	PASSED

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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	43.40	147.91	42.90	0.5	HORIZONTAL	PASSED
7206.000000	47.20	229.09	44.50	2.7	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	30.80	34.67	30.30	0.5	HORIZONTAL	PASSED
7206.000000	33.50	47.32	30.80	2.7	HORIZONTAL	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
37.795391	23.10	14.29	41.60	-18.5	VERTICAL	PASSED
74.848497	9.70	3.05	37.50	-27.8	HORIZONTAL	PASSED
108.256313	15.70	6.10	42.00	-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
4833.661323	44.00	158.49	43.10	0.9	VERTICAL	PASSED
7342.687375	47.30	231.74	44.10	3.2	VERTICAL	PASSED
12432.859719	51.70	384.59	41.30	10.4	VERTICAL	PASSED
13279.051102	53.20	457.09	41.10	12.1	HORIZONTAL	PASSED
15352.705411	53.90	495.45	38.00	15.9	VERTICAL	PASSED
15601.202405	54.80	549.54	38.30	16.5	VERTICAL	PASSED
16190.880762	56.10	638.26	38.10	18.0	HORIZONTAL	PASSED
17898.289579	56.00	630.96	38.00	18.0	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
4832.661323	31.20	36.31	30.30	0.9	VERTICAL	PASSED
7342.687375	34.40	52.48	31.20	3.2	VERTICAL	PASSED
12426.859719	38.90	88.10	28.60	10.3	VERTICAL	PASSED
13277.051102	40.00	100.00	28.00	12.0	HORIZONTAL	PASSED
15350.705411	41.10	113.50	25.20	15.9	VERTICAL	PASSED
15604.202405	41.50	118.85	25.00	16.5	VERTICAL	PASSED
16192.880762	42.80	138.04	24.80	18.0	HORIZONTAL	PASSED
17896.789579	43.20	144.54	25.20	18.0	VERTICAL	PASSED

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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	42.80	138.04	43.20	-0.4	HORIZONTAL	PASSED
7440.000000	48.50	266.07	44.80	3.7	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	29.90	31.26	30.30	-0.4	HORIZONTAL	PASSED
7440.000000	34.70	54.33	31.00	3.7	VERTICAL	PASSED

6.3. WLAN Test results

6.3.1 DSSS mode, BPSK modulation, 1 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	48.20	257.04	47.40	0.8	VERTICAL	PASSED
7236.000000	47.50	237.14	44.90	2.6	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	40.20	102.33	39.40	0.8	VERTICAL	PASSED
7236.000000	34.00	50.12	31.40	2.6	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
38.176353	19.30	9.23	38.00	-18.7	VERTICAL	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
2362.939880	51.80	389.05	56.80	-5.0	HORIZONTAL	PASSED
4884.269539	46.70	216.27	45.90	0.8	VERTICAL	PASSED
7323.149299	48.60	269.15	45.60	3.0	HORIZONTAL	PASSED
12493.487976	52.40	416.87	41.70	10.7	VERTICAL	PASSED
13269.031062	53.00	446.68	41.00	12.0	HORIZONTAL	PASSED
15358.721443	53.50	473.15	37.70	15.8	HORIZONTAL	PASSED
15900.299599	54.30	518.80	37.10	17.2	HORIZONTAL	PASSED
16184.876754	54.90	555.90	37.00	17.9	HORIZONTAL	PASSED
17875.243487	55.80	616.60	37.90	17.9	HORIZONTAL	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
2363.939880	41.60	120.23	46.60	-5.0	HORIZONTAL	PASSED
4884.269539	38.20	81.28	37.40	0.8	VERTICAL	PASSED
7323.649299	37.70	76.74	34.70	3.0	HORIZONTAL	PASSED
12491.487976	39.50	94.41	28.80	10.7	VERTICAL	PASSED
13267.531062	40.00	100.00	28.10	11.9	HORIZONTAL	PASSED
15358.721443	40.80	109.65	25.00	15.8	HORIZONTAL	PASSED
15901.299599	41.90	124.45	24.70	17.2	HORIZONTAL	PASSED
16188.376754	42.80	138.04	24.80	18.0	HORIZONTAL	PASSED
17873.743487	42.80	138.04	24.90	17.9	HORIZONTAL	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	51.20	363.08	51.00	0.2	VERTICAL	PASSED
7386.000000	48.50	266.07	45.00	3.5	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	46.60	213.80	46.40	0.2	VERTICAL	PASSED
7386.000000	35.00	56.23	31.50	3.5	VERTICAL	PASSED

6.3.2 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	45.40	186.21	44.60	0.8	VERTICAL	PASSED
7236.000000	46.80	218.78	44.20	2.6	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	32.20	40.74	31.40	0.8	VERTICAL	PASSED
7236.000000	34.10	50.70	31.50	2.6	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
38.235872	21.40	11.75	40.10	-18.7	VERTICAL	PASSED
51.862325	17.30	7.33	45.10	-27.8	VERTICAL	PASSED
74.869940	15.40	5.89	43.20	-27.8	HORIZONTAL	PASSED
75.088978	15.20	5.75	42.90	-27.7	HORIZONTAL	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
2368.939880	53.10	451.86	58.30	-5.2	HORIZONTAL	PASSED
4882.265531	44.10	160.32	43.30	0.8	VERTICAL	PASSED
7329.159319	48.00	251.19	45.00	3.0	VERTICAL	PASSED
13312.623246	52.70	431.52	40.60	12.1	HORIZONTAL	PASSED
14477.963928	53.20	457.09	39.30	13.9	HORIZONTAL	PASSED
15378.751503	53.80	489.78	38.10	15.7	VERTICAL	PASSED
15849.199399	54.80	549.54	37.70	17.1	VERTICAL	PASSED
16193.380762	55.90	623.73	37.90	18.0	VERTICAL	PASSED
17915.323647	56.20	645.65	37.90	18.3	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
2365.439880	40.00	100.00	45.10	-5.1	HORIZONTAL	PASSED
4883.265531	31.40	37.15	30.60	0.8	VERTICAL	PASSED
7332.659319	34.50	53.09	31.40	3.1	VERTICAL	PASSED
13314.623246	39.80	97.72	27.70	12.1	HORIZONTAL	PASSED
14483.463928	39.80	97.72	25.90	13.9	HORIZONTAL	PASSED
15375.751503	40.50	105.93	24.80	15.7	VERTICAL	PASSED
15850.699399	42.10	127.35	25.00	17.1	VERTICAL	PASSED
16193.380762	42.80	138.04	24.80	18.0	VERTICAL	PASSED
17914.323647	43.30	146.22	25.10	18.2	HORIZONTAL	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	44.60	169.82	44.40	0.2	HORIZONTAL	PASSED
7386.000000	48.40	263.03	44.90	3.5	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
4924.000000	32.30	41.21	32.10	0.2	HORIZONTAL	PASSED
7386.000000	35.00	56.23	31.50	3.5	HORIZONTAL	PASSED

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7. AC powerline conducted emissions

(FCC §15.207, RSS-GEN 7.2.2)

EUT with DUT number	
Accessories with DUT numbers	
Operation Voltage [V] / [Hz]	
Result	
Remarks	
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	
Date of measurements	
Measured by	

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

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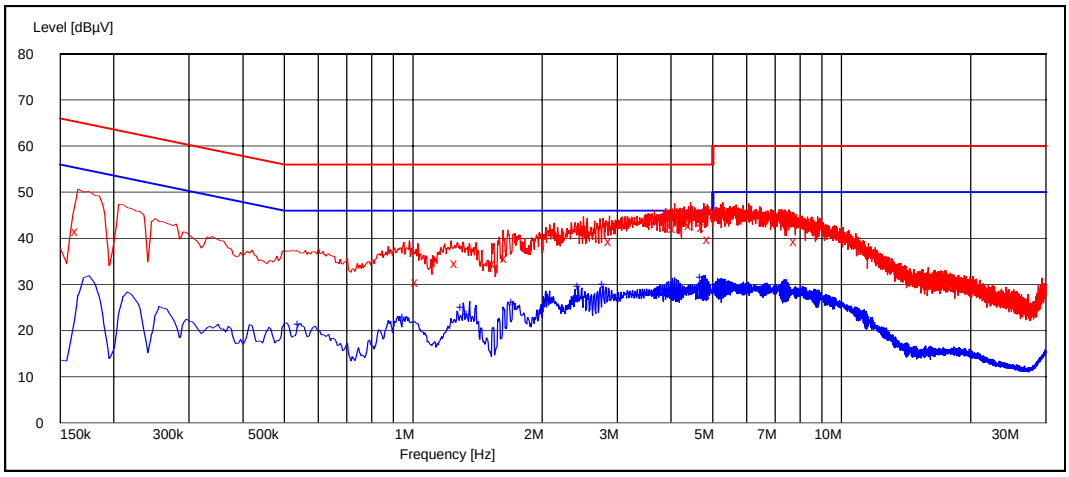
7.2. Bluetooth Test results

7.2.1 GFSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.165000	41.50	N	PASSED
1.025000	30.50	N	PASSED
1.265000	34.70	N	PASSED
1.555000	34.70	N	PASSED
1.655000	35.80	N	PASSED
2.895000	39.30	N	PASSED
4.090000	42.30	N	PASSED
4.455000	43.00	N	PASSED
4.775000	42.40	N	PASSED
4.915000	39.90	N	PASSED
7.850000	39.50	N	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.545000	21.30	N	PASSED
0.955000	23.00	N	PASSED
1.305000	25.00	N	PASSED
1.350000	23.50	N	PASSED
1.715000	26.20	N	PASSED
2.450000	29.70	N	PASSED
2.790000	30.10	N	PASSED
4.725000	31.60	N	PASSED
4.900000	29.70	N	PASSED
8.145000	29.20	N	PASSED

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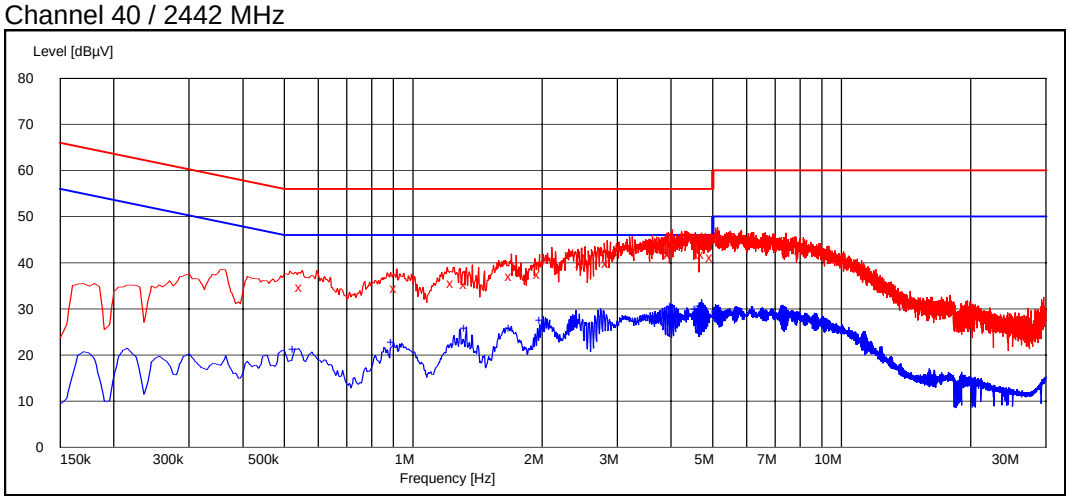
7.2.2 8DPSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.550000	34.60	N	PASSED
0.915000	34.50	N	PASSED
1.240000	35.50	N	PASSED
1.330000	35.30	N	PASSED
1.695000	37.10	N	PASSED
1.970000	37.50	N	PASSED
2.475000	39.90	N	PASSED
2.845000	39.80	N	PASSED
3.985000	42.30	N	PASSED
3.990000	42.00	N	PASSED
4.765000	42.00	N	PASSED
4.995000	41.30	N	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.530000	21.30	N	PASSED
0.900000	22.80	N	PASSED
1.330000	25.90	N	PASSED
1.690000	25.90	N	PASSED
1.995000	27.50	N	PASSED
4.030000	26.80	L1	PASSED
4.035000	30.50	N	PASSED
4.600000	29.90	N	PASSED
4.720000	30.50	N	PASSED

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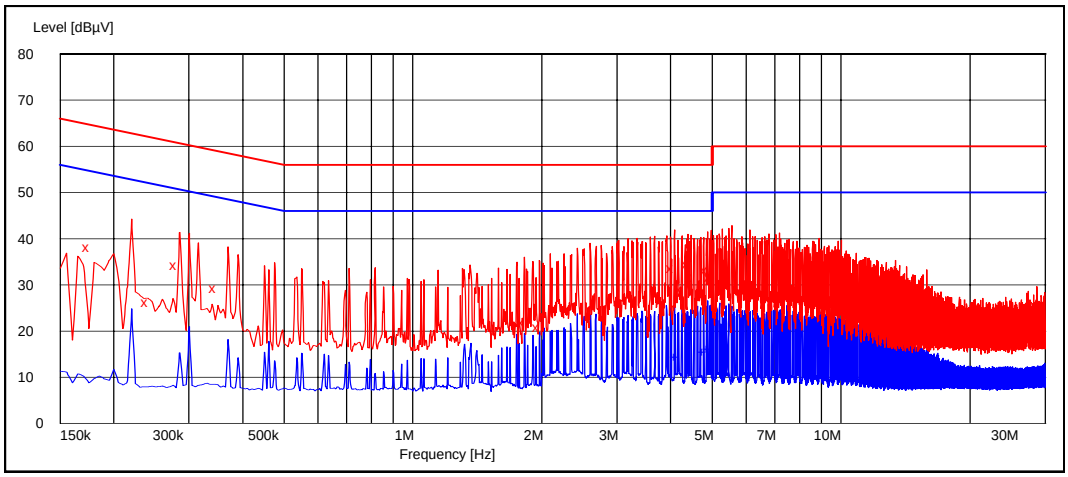
7.3. WLAN Test results

7.3.1 DSSS mode, BPSK modulation, 1 Mbps data rate

Channel 7 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.175000	38.10	N	PASSED
0.240000	26.30	N	PASSED
0.280000	34.20	L1	PASSED
0.345000	29.30	N	PASSED
1.815000	22.00	L1	PASSED
1.965000	20.90	L1	PASSED
4.040000	33.60	L1	PASSED
4.245000	29.20	N	PASSED
4.405000	34.50	L1	PASSED
4.475000	31.70	L1	PASSED
4.860000	33.10	L1	PASSED
4.960000	31.60	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
4.125000	14.30	L1	PASSED
4.790000	15.50	N	PASSED
4.915000	16.10	N	PASSED

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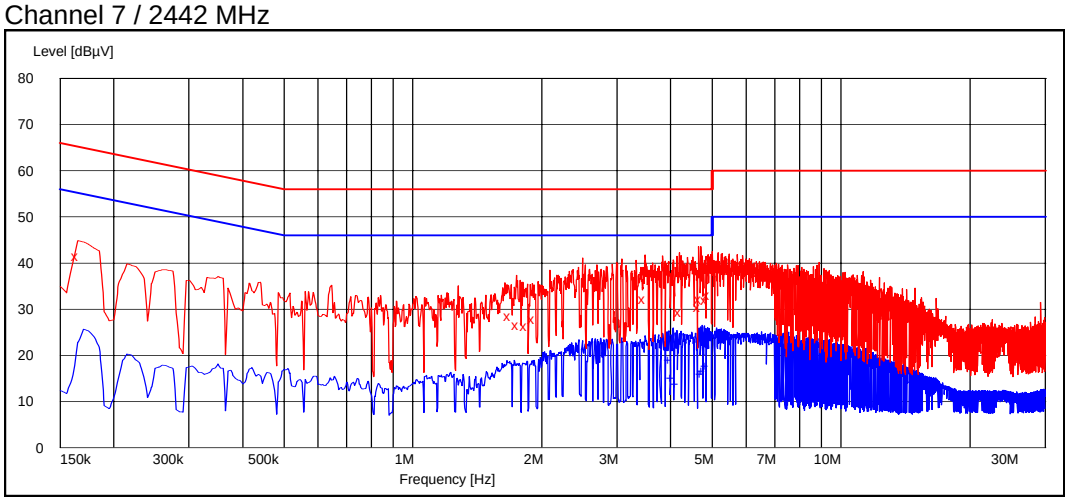
7.3.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 7 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.165000	41.60	L1	PASSED
1.685000	28.60	L1	PASSED
1.760000	26.60	L1	PASSED
1.845000	26.30	L1	PASSED
1.920000	27.90	L1	PASSED
3.480000	32.10	L1	PASSED
4.215000	29.30	L1	PASSED
4.670000	30.60	N	PASSED
4.705000	32.10	N	PASSED
4.870000	32.00	L1	PASSED
4.920000	33.10	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
4.000000	19.00	N	PASSED
4.045000	15.00	L1	PASSED
4.130000	13.90	L1	PASSED
4.740000	15.90	L1	PASSED
4.780000	16.60	L1	PASSED
4.865000	17.70	L1	PASSED

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8. 20 dB bandwidth

(FCC §15.247(a)(1), RSS-210 A8.1 (1))

EUT with DUT number	RM-160, DUT 12024
Accessories with DUT numbers	SD-13, DUT 12033; AD-43, DUT 12026, HS-45, DUT 12027
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Phone tested slide open mode.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 42 / 101.3
Date of measurements	26.06.2007
Measured by	Jani Koskinen

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

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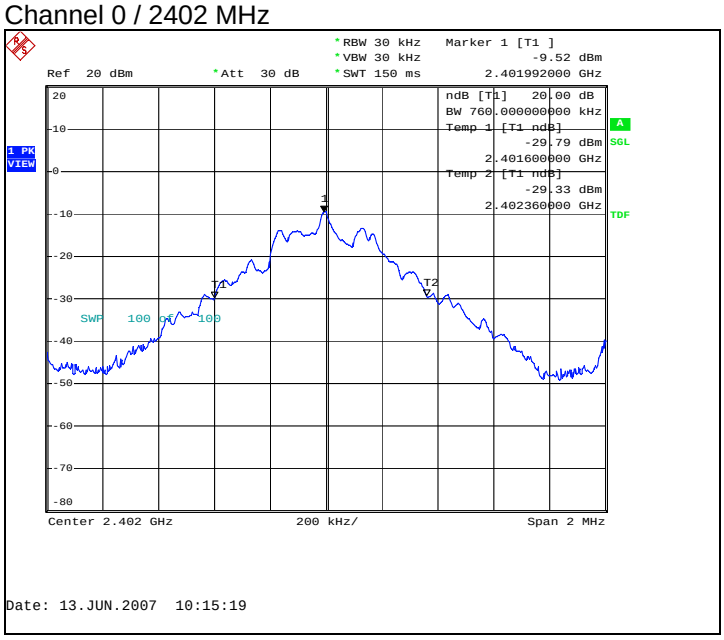
8.2. Bluetooth Test results

8.2.1 GFSK modulation, PRBS packet type

Channel / f_C [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	760.000	PASSED
40 / 2442	760.000	PASSED
78 / 2480	764.000	PASSED

Channel 0 / 2402 MHz



Channel 40 / 2442 MHz

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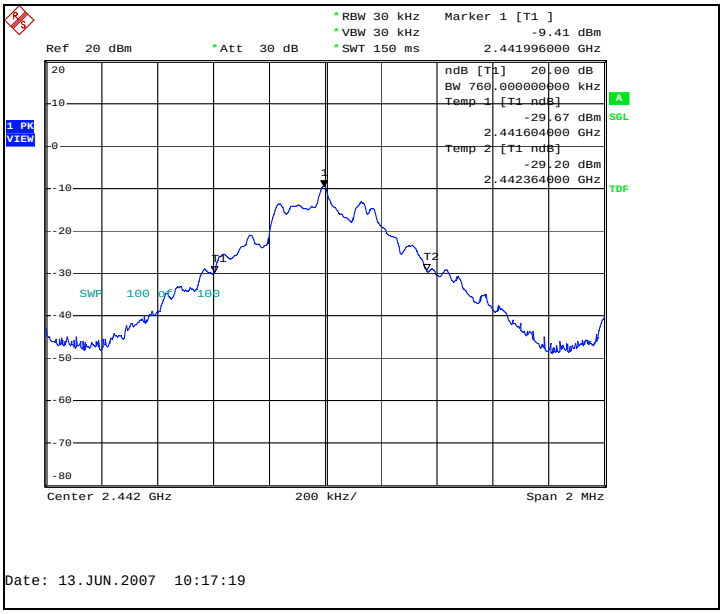
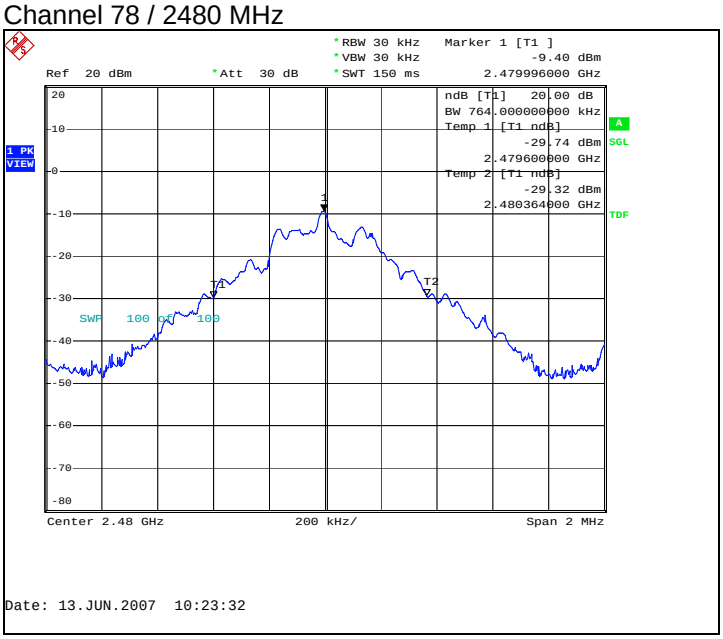


Channel 78 / 2480 MHz



8.2.2 8DPSK modulation, PRBS packet type

Channel / f_C [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	1260.000	PASSED
40 / 2442	1256.000	PASSED
78 / 2480	1260.000	PASSED

Channel 0 / 2402 MHz

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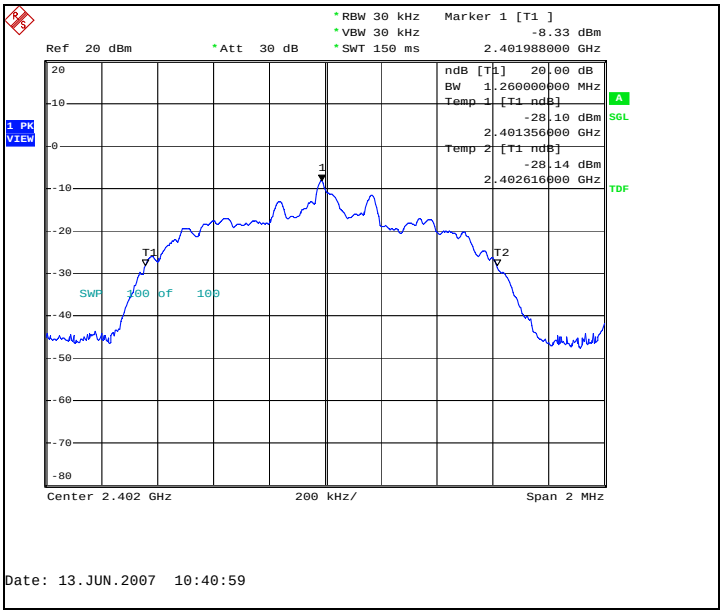
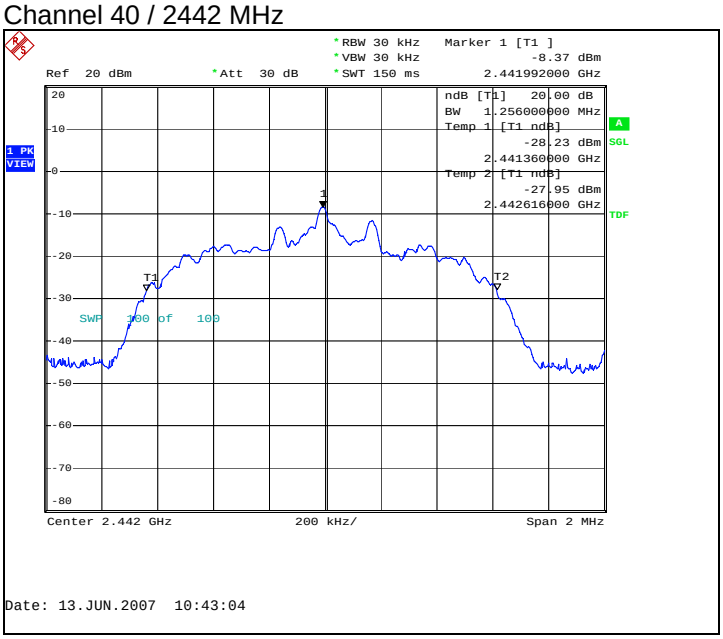


Channel 40 / 2442 MHz



Channel 78 / 2480 MHz

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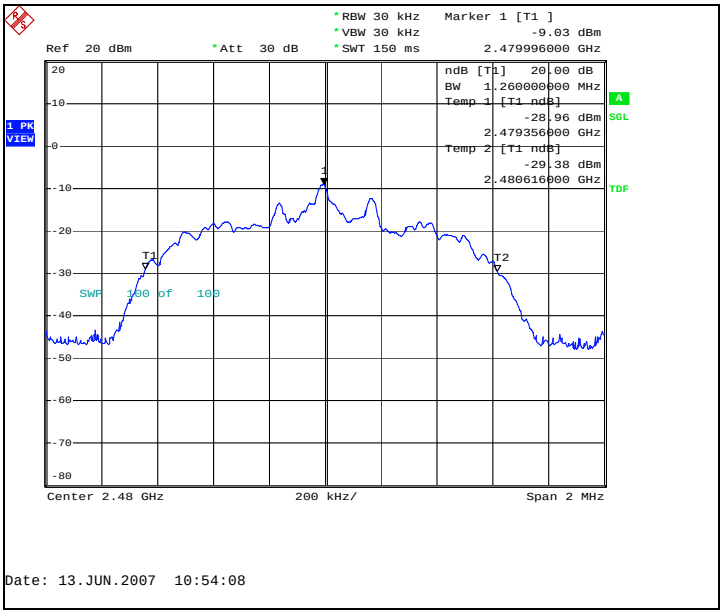

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9. Carrier frequency separation

(FCC §15.247(a)(1), RSS-210 A8.1 (2))

EUT with DUT number	RM-160, DUT 12024
Accessories with DUT numbers	SD-13, DUT 12033; AD-43, DUT 12026, HS-45, DUT 12027
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Phone tested slide open mode.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 42 / 101.3
Date of measurements	26.06.2007
Measured by	Jani Koskinen

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

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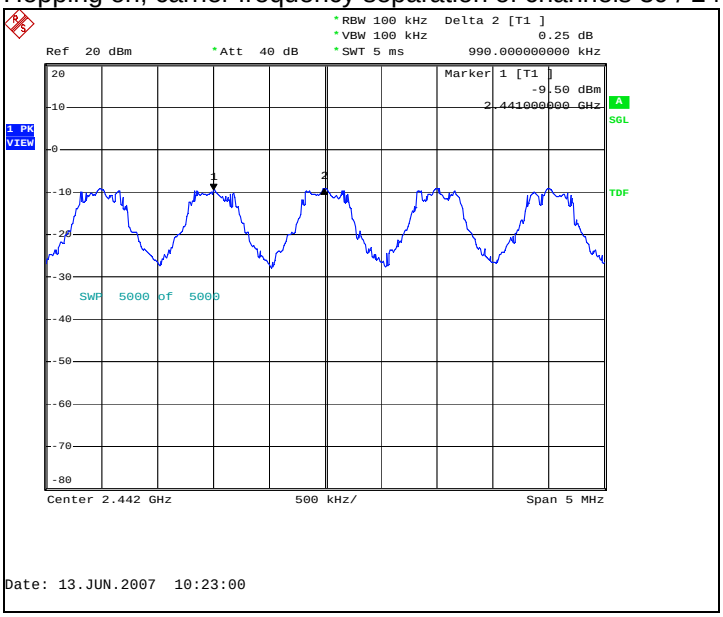
9.2. Bluetooth Test results

9.2.1 GFSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
990	

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	

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

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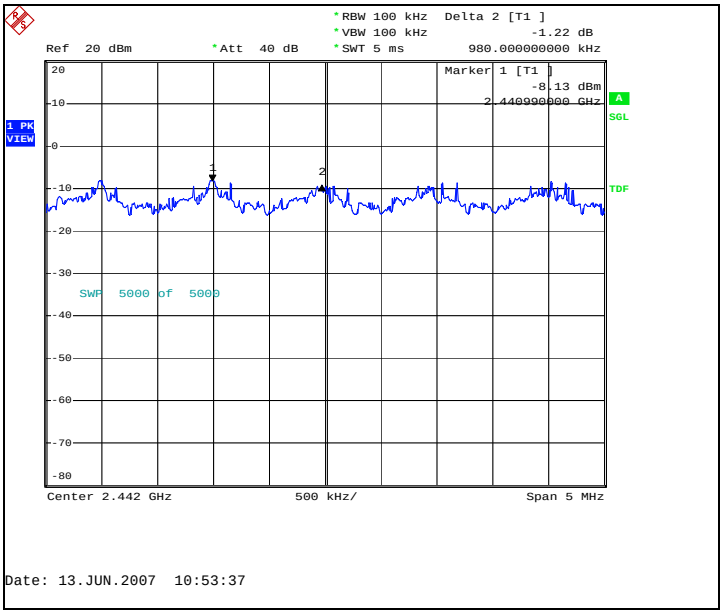

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10. Number of hopping frequencies

(FCC §15.247(a)(1)(iii), RSS-210 A8.1 (4))

EUT with DUT number	RM-160, DUT 12024
Accessories with DUT numbers	SD-13, DUT 12033; AD-43, DUT 12026, HS-45, DUT 12027
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Phone tested slide open mode.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 42 / 101.3
Date of measurements	26.06.2007
Measured by	Jani Koskinen

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

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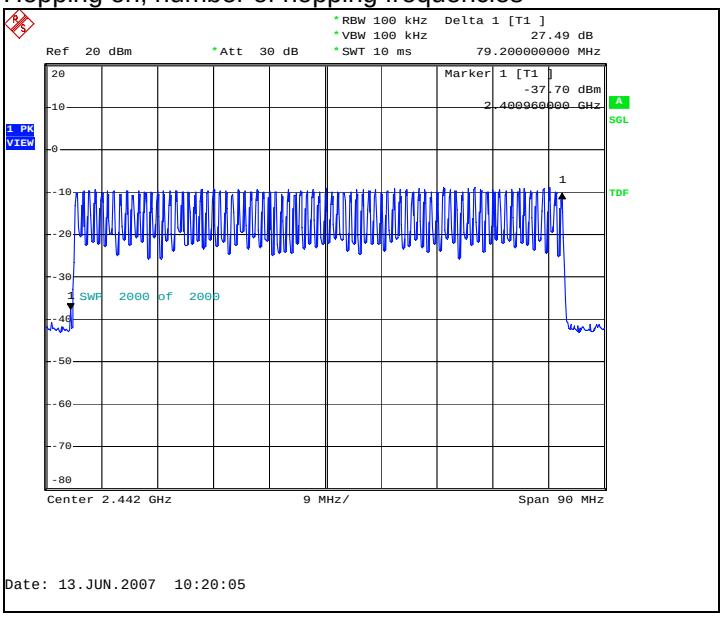
10.2. Bluetooth Test results

10.2.1 GFSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
80	PASSED

Hopping on, number of hopping frequencies



10.2.2 8DPSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
69	PASSED

Hopping on, number of hopping frequencies

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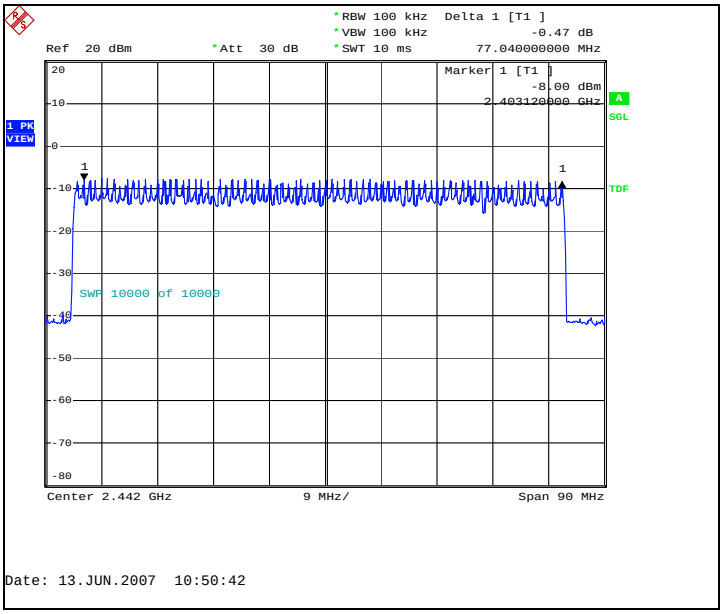

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11. Time of occupancy

(FCC §15.247(a)(1)(iii), RSS-210 A8.1 (4))

EUT with DUT number	RM-160, DUT 12024
Accessories with DUT numbers	SD-13, DUT 12033; AD-43, DUT 12026, HS-45, DUT 12027
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Phone tested slide open mode.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 42 / 101.3
Date of measurements	26.06.2007
Measured by	Jani Koskinen

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

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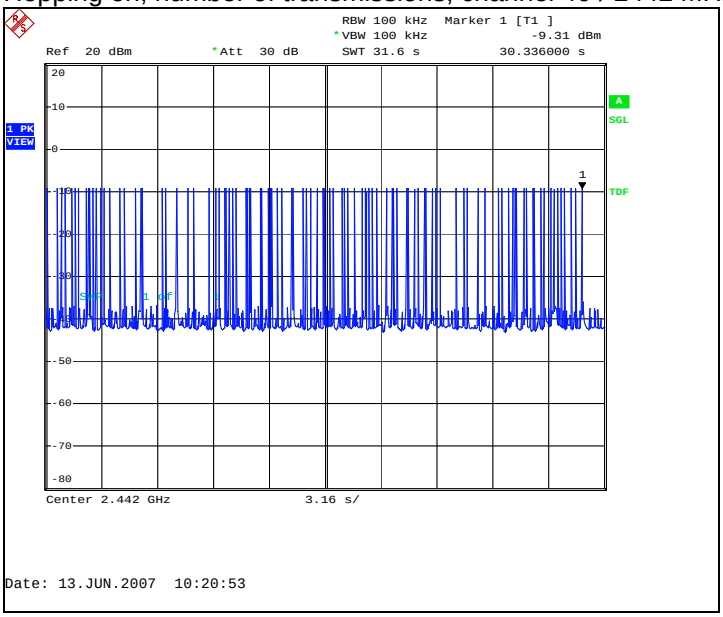
11.2. Bluetooth test results

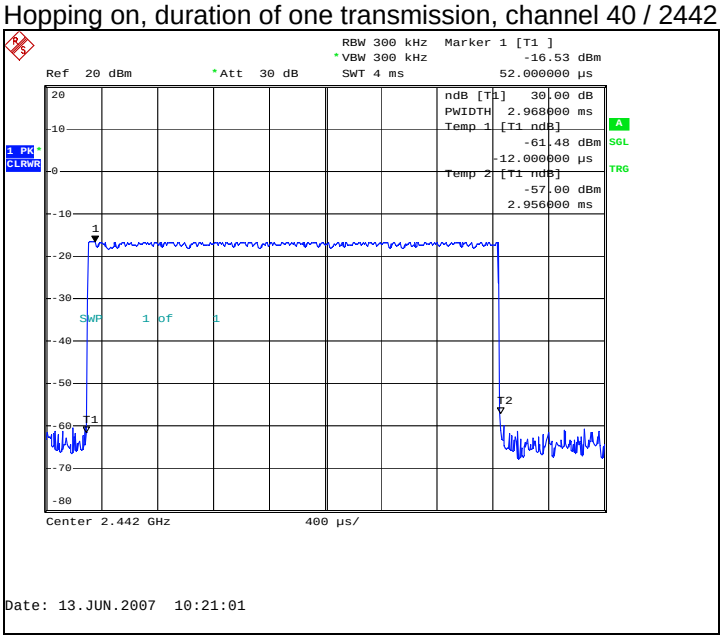
11.2.1 GFSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [µs]	Time of occupancy [s]	Result
88	2 968	0.261184	PASSED

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



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



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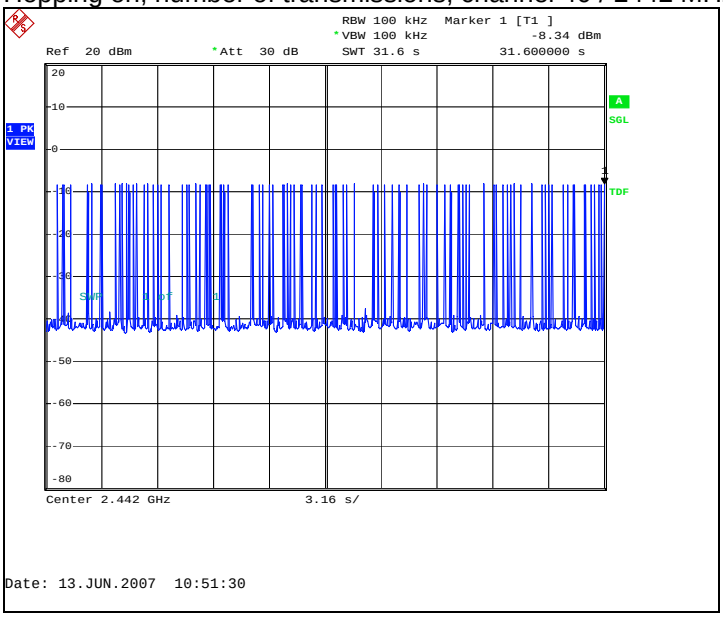
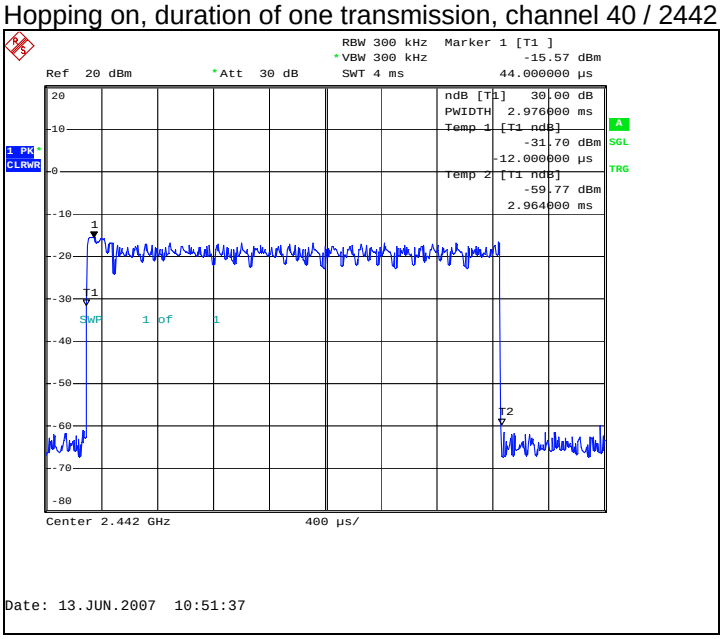
11.2.2 8DPSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [µs]	Time of occupancy [s]	Result
86	2 976	0.255936	PASSED

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



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



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12. 6 dB bandwidth (FCC §15.247(a)(2), RSS-210 A8.2 (1))

EUT with DUT number	RM-160, DUT 12024
Accessories with DUT numbers	SD-13, DUT 12033; AD-43, DUT 12026, HS-45, DUT 12027
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Phone tested slide open mode.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 42 / 101.3
Date of measurements	26.06.2007
Measured by	Jani Koskinen

12.1. 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

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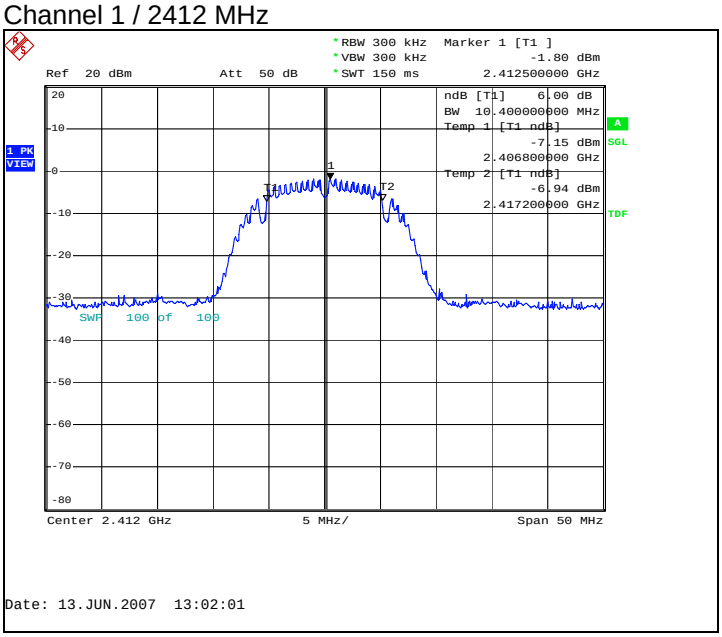
12.2. WLAN test results

12.2.1 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

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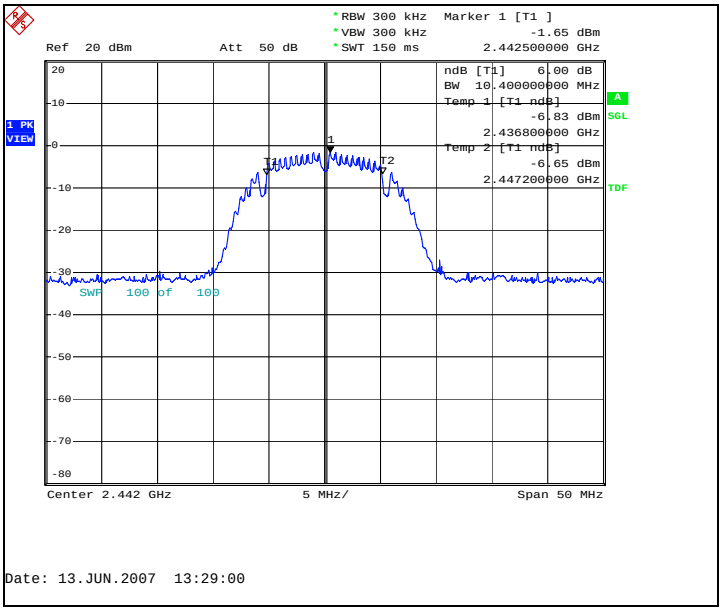
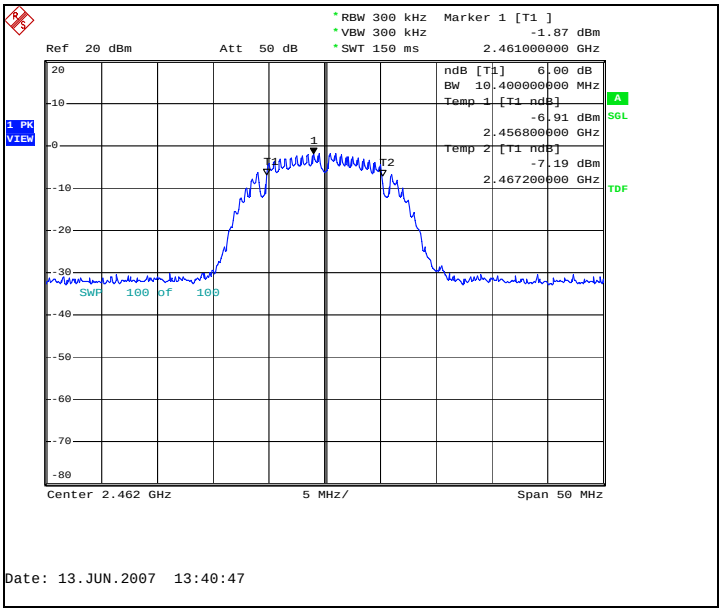


Channel 11 / 2462 MHz



12.2.2 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

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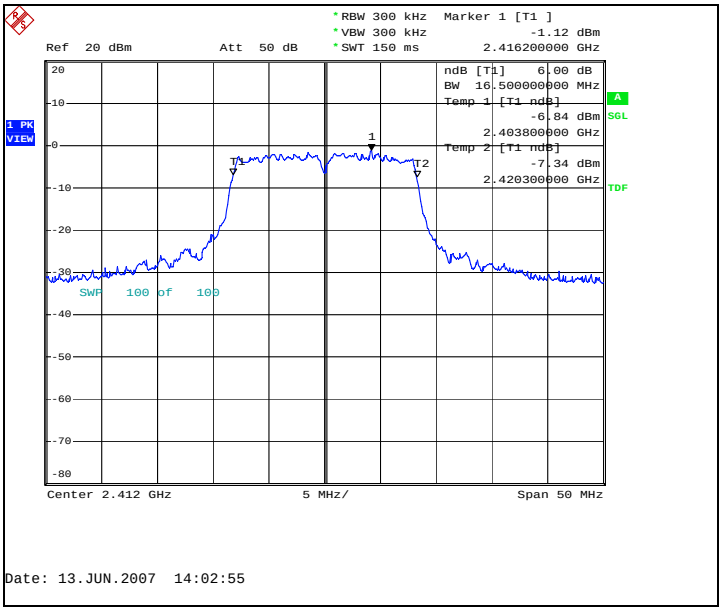
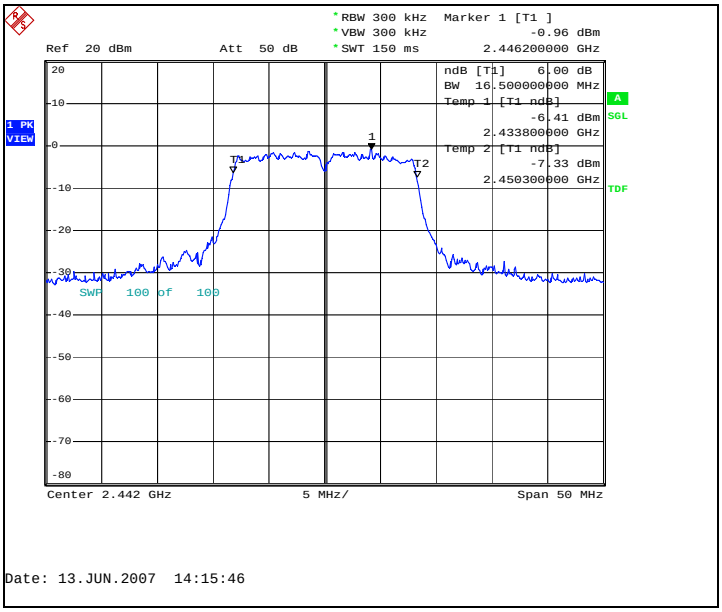


Channel 7 / 2442 MHz



Channel 11 / 2462 MHz

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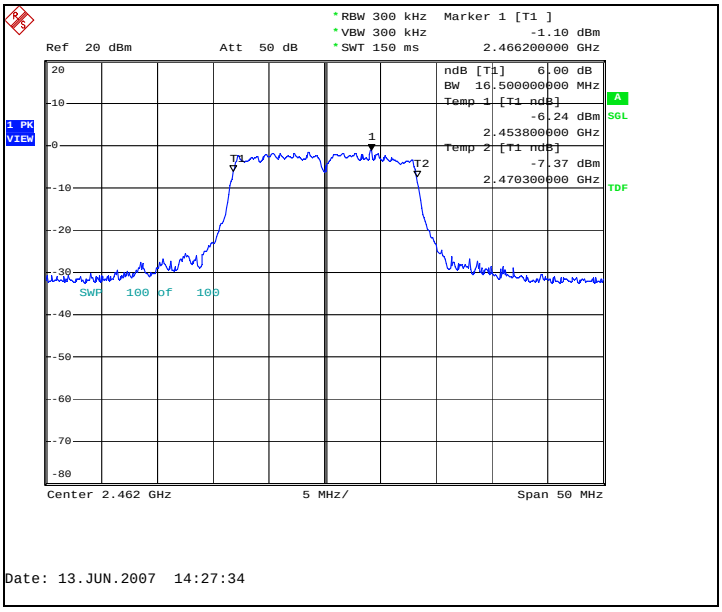

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13. Power spectral density

(FCC §15.247(e), RSS-210 A8.2 (2))

EUT with DUT number	RM-160, DUT 12024
Accessories with DUT numbers	SD-13, DUT 12033; AD-43, DUT 12026, HS-45, DUT 12027
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Phone tested slide open mode.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 42 / 101.3
Date of measurements	26.06.2007
Measured by	Jani Koskinen

13.1. 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

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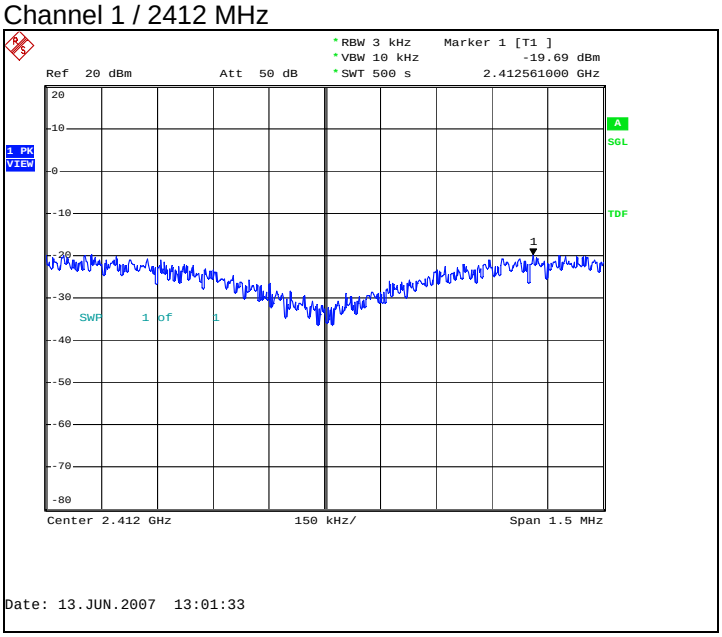
13.2. WLAN test results

13.2.1 DSSS mode, BPSK modulation, 1 Mbps data rate

Channel / f_C [MHz]	P [dBm]	Result
1 / 2412	-19.69	PASSED
7 / 2442	-19.73	PASSED
11 / 2462	-19.88	PASSED

Channel 1 / 2412 MHz



Channel 7 / 2442 MHz

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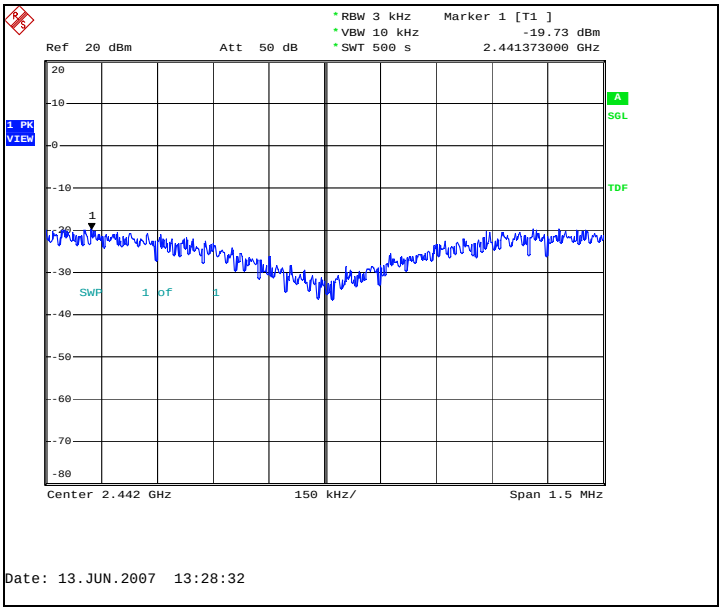
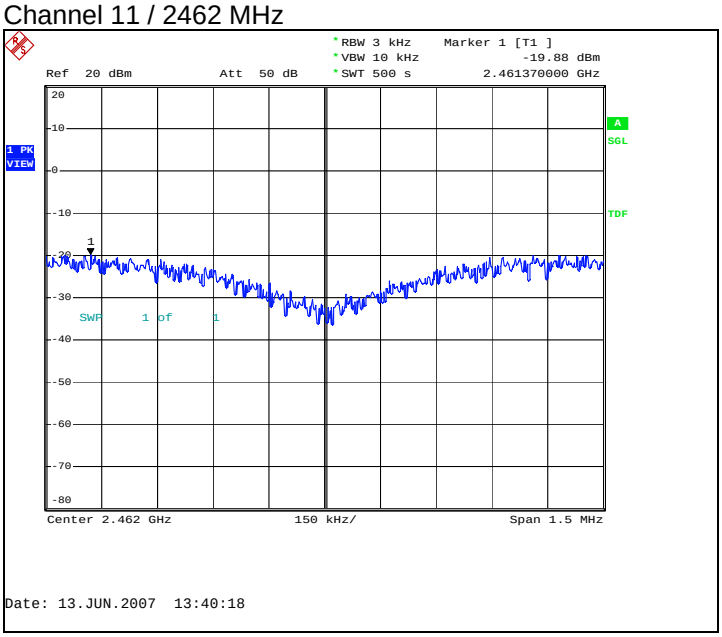


Channel 11 / 2462 MHz



13.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f_C [MHz]	P [dBm]	Result
1 / 2412	-20.73	PASSED
7 / 2442	-20.52	PASSED
11 / 2462	-20.70	PASSED

Channel 1 / 2412 MHz

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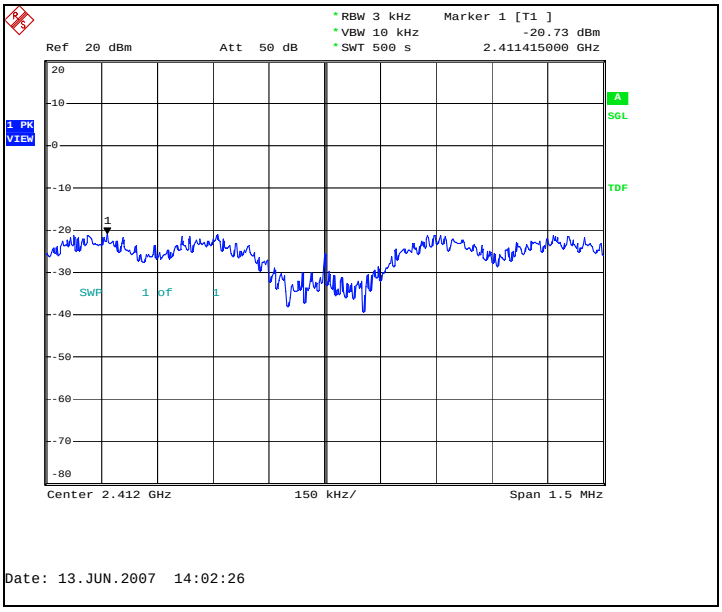
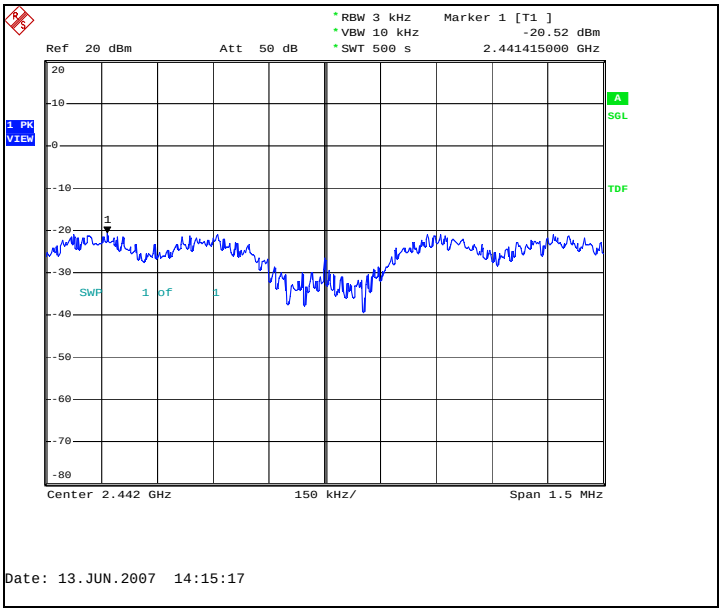


Channel 7 / 2442 MHz



Channel 11 / 2462 MHz

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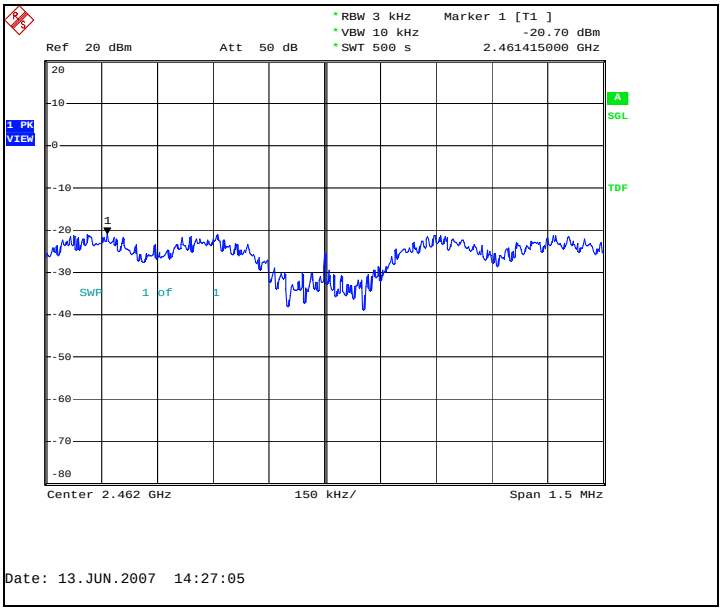

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14. Test Equipment

14.1. 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

14.2. 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

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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

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