FCC Part 15C Compliance Test Report

Test Report no.:	Tre_FCC_0818_03.doc	**Date of Report:**	27-Jun-2008
Number of pages:	76	**Customer's Contact person:**	Asko Pasanen
Testing laboratory:	TCC Nokia Tampere Laboratory P.O. Box 68 Sinitaival 5 FIN-33720 TAMPERE, FINLAND Tel. +358 (0) 7180 46800 Fax. +358 (0) 7180 46880	**Customer:**	Nokia Corporation P.O. Box 50 Mattilanniemi 6-8 FIN-40101 JYVÄSKYLÄ, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 78000
FCC listing no.: **IC recognition no.:**	94436 3608		
Tested devices/ accessories:	**Phone RM-333 / Battery BL-5K, AC-Charger AC-10E, Audio Adapter AD-54, Headset HS-45**		
FCC ID:	QURRM-333	**IC:**	661AC-RM333
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:	 Digitally signed by Jari Jantunen Date: 2008.06.27 08:59:53 +03'00'		

Jari Jantunen, Test System Manager

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	28-Apr-2008
Testing completed	26-Jun-2008
The customer's contact person	Asko Pasanen
Test Plan referred to	T:\Projects\RM-333\TestPlan_RS\RS_Test_Plan_RM-333.xls
Notes	-
Document name	T:\Projects\RM-333\EMC\Results\FCC\Tre_FCC_0818_03.doc

1.1. EUT and Accessory Information

The EUT is a 7-band (GSM850/900/1800/1900 and WCDMA Band I/II(1900)/VIII) mobile phone with GPRS, EGPRS, Bluetooth, WLAN and FM transmitter. Bluetooth and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-333	004401101023204	1004	-	0.35	41470
Phone	RM-333	004401101023121	1004	-	0.35	41471
Battery	BL-5K	-	-	-	-	41477
AC-Charger	AC-10E	-	-	-	-	41478
Audio Adapter	AD-54	-	-	-	-	41475
Headset	HS-45	-	-	-	-	41473

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

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FM TX:

Section in CFR 47	Section in RSS-210	Name of the test	Result
15.239(a)	A2.8	Field strength of the fundamental signal	PASSED
15.239(c)	A2.8	Spurious radiated emissions	PASSED
15.207	6.6	AC powerline conducted emissions	PASSED
15.239(a)	A2.8	26 dB bandwidth	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 Tampere Laboratory.

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CONTENTS

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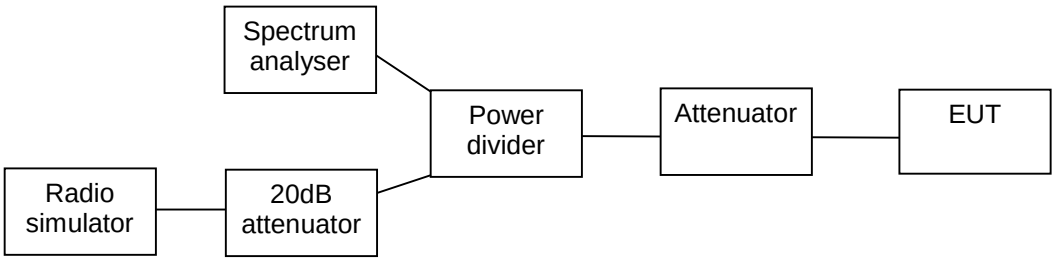
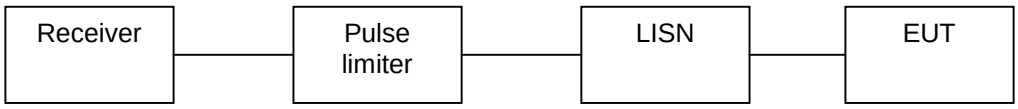
2. Test setups

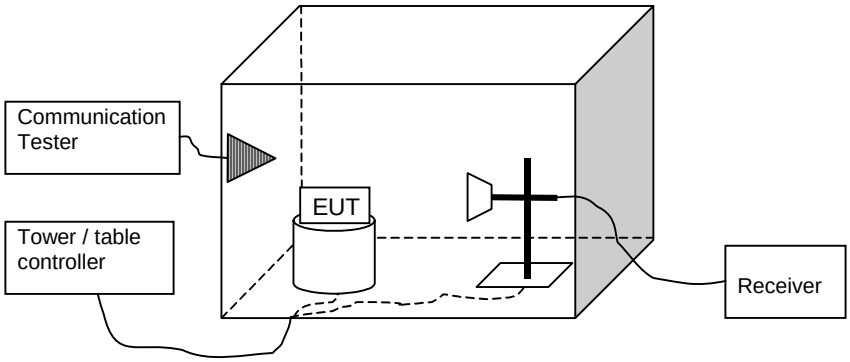
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Radiated test setup



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3. Conducted peak output power

(FCC §15.247(b)(1), RSS-210 A8.4 (2))

EUT with DUT number	RM-333 DUT 41470
Accessories with DUT numbers	BL-5K DUT 41477 / AC-10E DUT 41478 / AD-54 DUT 41475 / HS-45 DUT 41473
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 102
Date of measurements	29-Apr-2008
Measured by	Petteri Suni

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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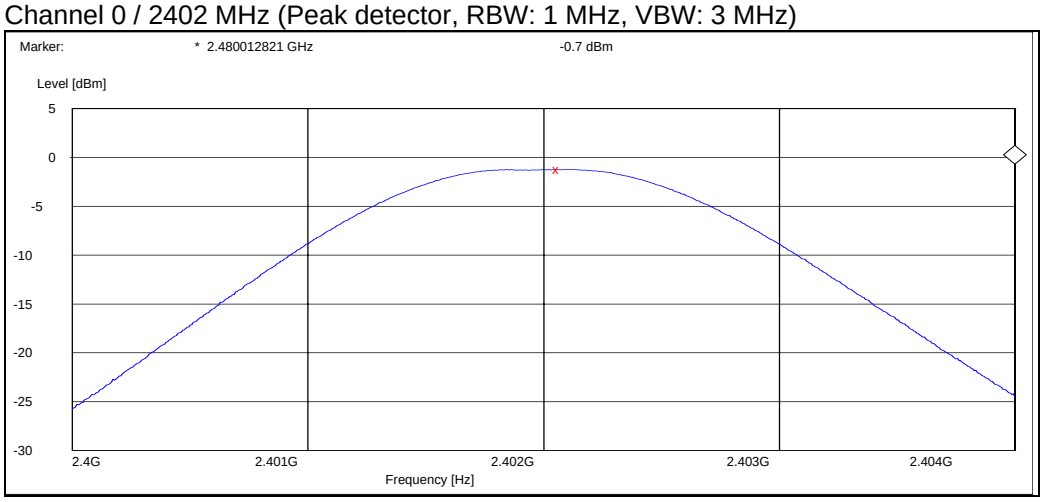
3.2. Bluetooth Test results

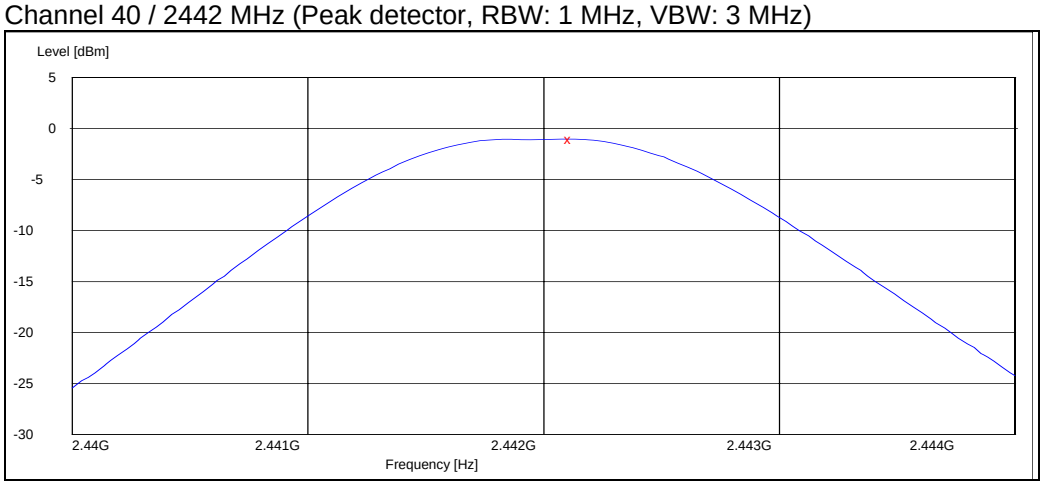
3.2.1 GFSK modulation, PRBS packet type

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
0 / 2402	-1.20	0.759	PASSED
40 / 2442	-1.00	0.794	PASSED
78 / 2480	-0.70	0.851	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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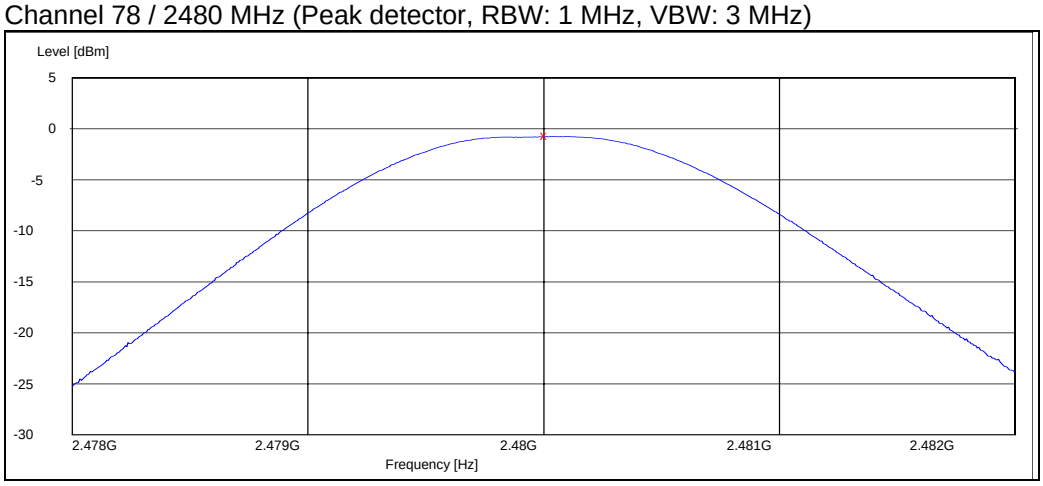
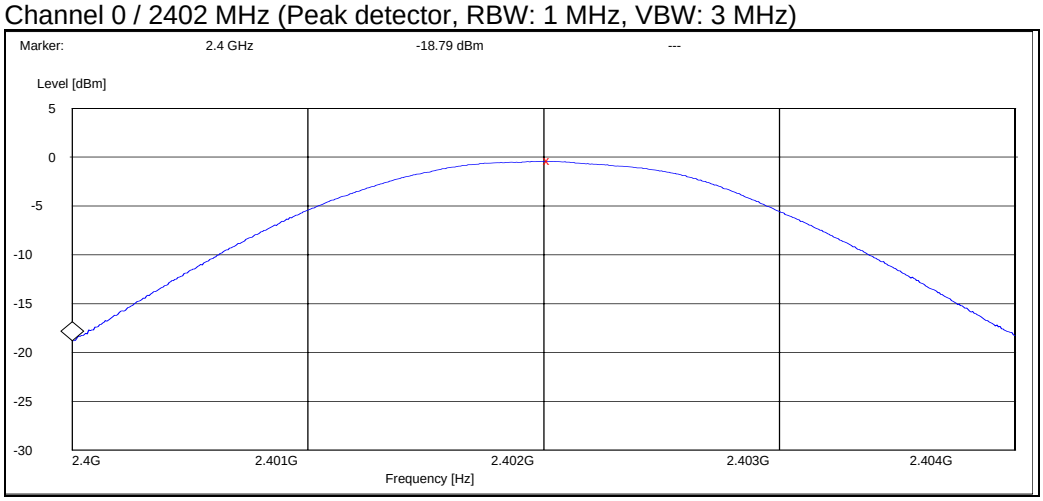
Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



3.2.2 8DPSK modulation, PRBS packet type

Channel / f_C [MHz]	P [dBm]	P [mW]	Result
0 / 2402	-0.30	0.933	PASSED
40 / 2442	0.00	1.000	PASSED
78 / 2480	0.40	1.096	PASSED

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



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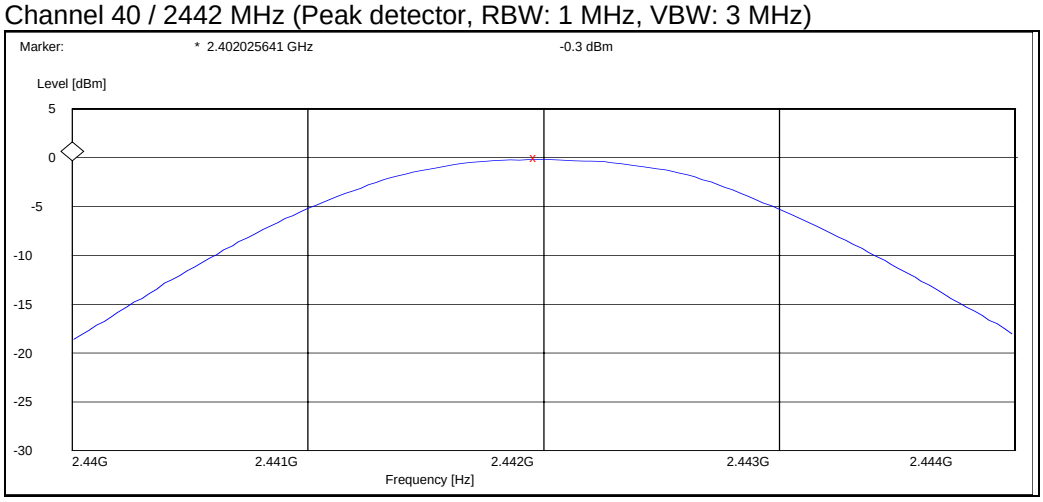
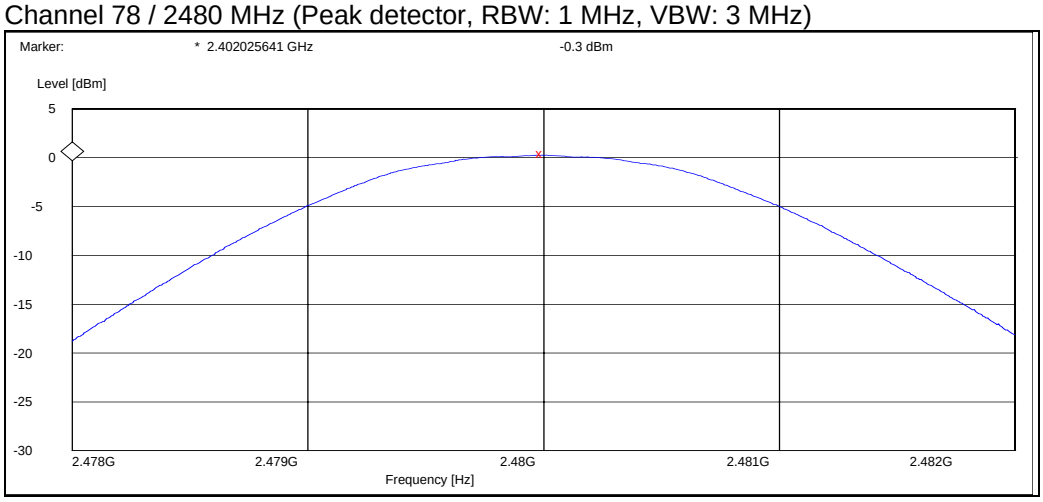
Channel 40 / 2442 MHz (Peak detector, RBW: 1 MHz, VBW: 3 MHz)



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



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4. Band edge compliance of RF emissions

(FCC §15.247(d), RSS-210 A8.5)

EUT with DUT number	RM-333 DUT 41471
Accessories with DUT numbers	BL-5K DUT 41477, AC-10E DUT 41478, AD-54 DUT 41475, HS-45 DUT 41473
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 48 / 101.5
Date of measurements	07-May-2008
Measured by	Jari Jantunen

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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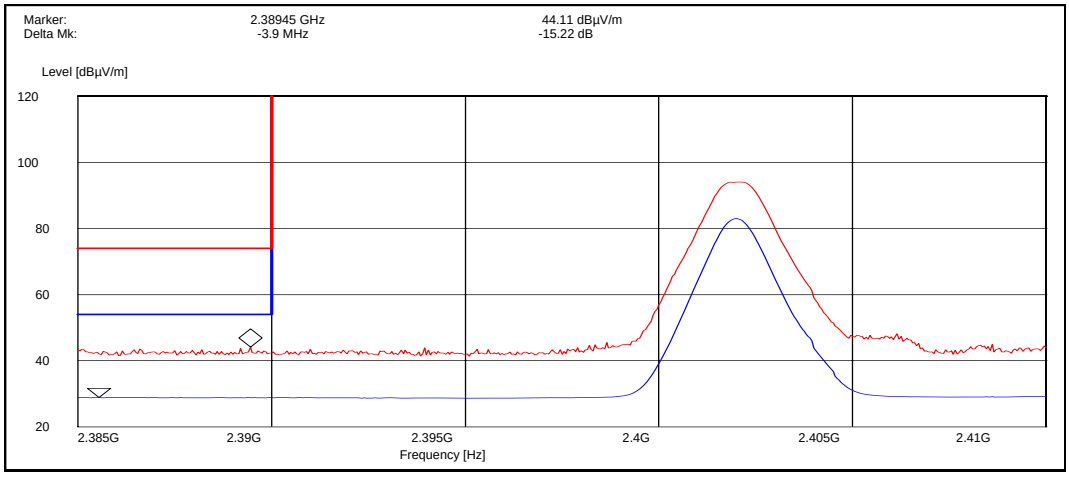
4.2. Bluetooth Test results

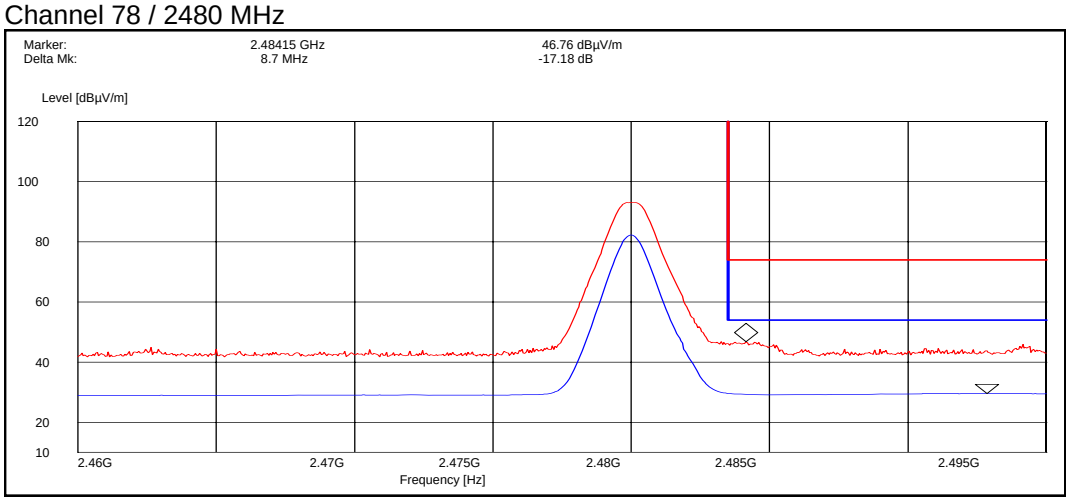
4.2.1 GFSK modulation, PRBS packet type

Channel 0 / 2402 MHz



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	44.10	PASSED
Average	28.90	PASSED

Channel 78 / 2480 MHz



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	46.80	PASSED
Average	29.60	PASSED

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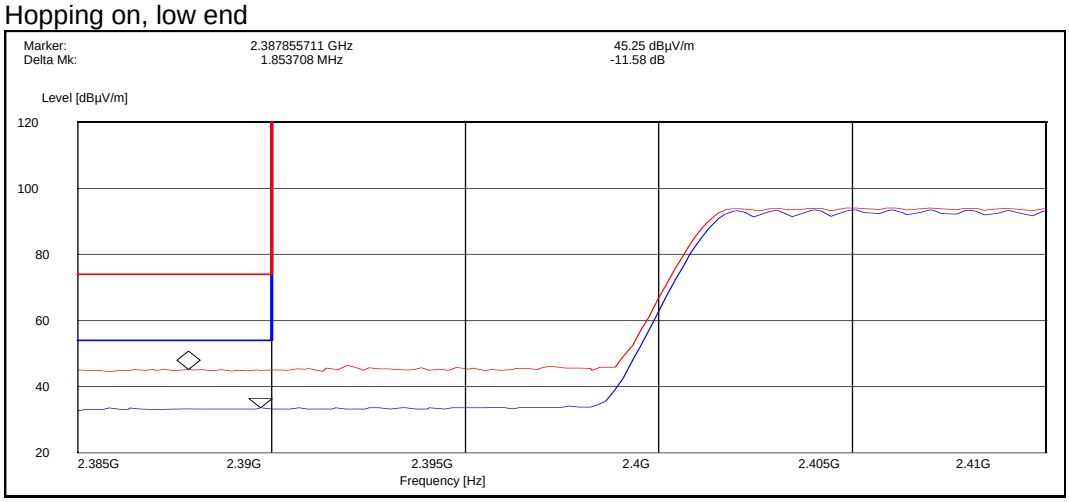
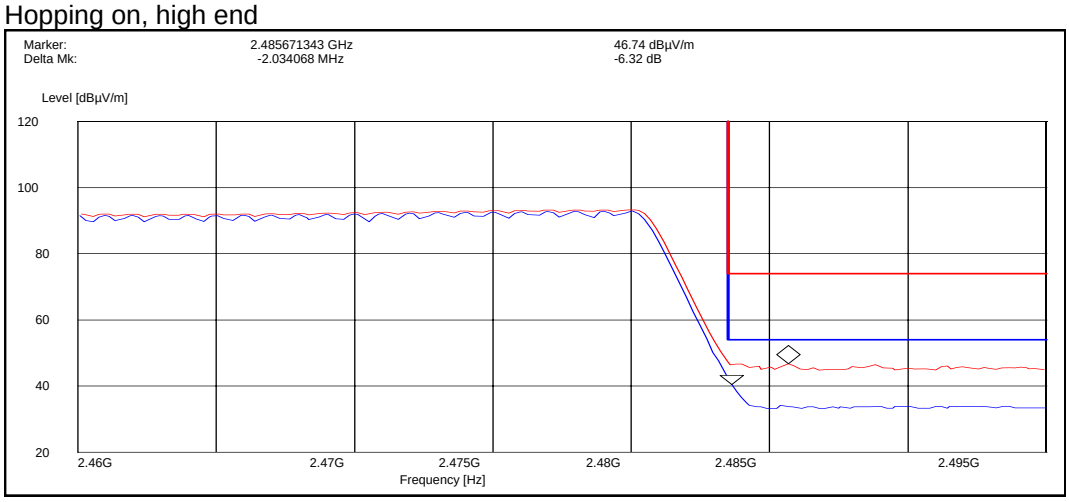
Hopping on, low end



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	45.30	PASSED
Average	33.70	PASSED

Hopping on, high end



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	46.70	PASSED
Average	40.40	PASSED

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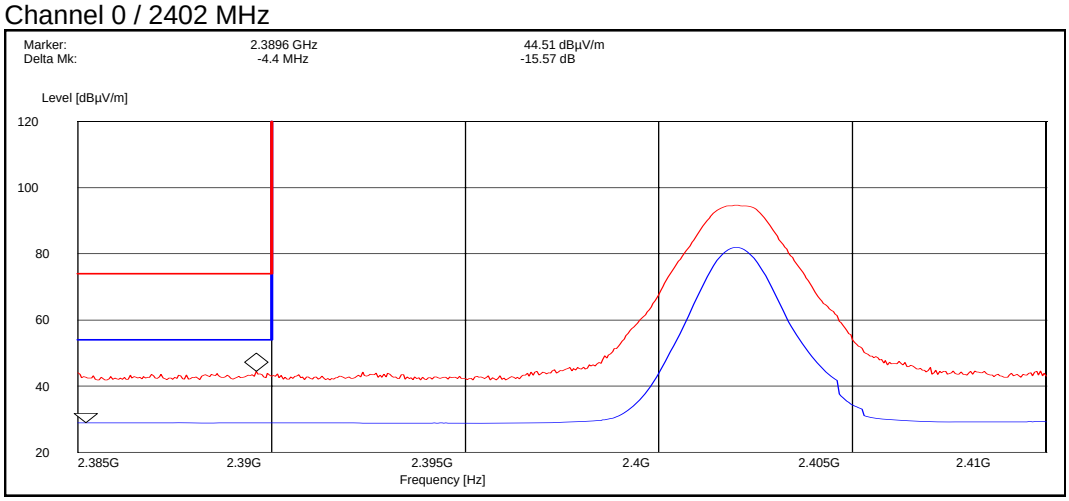
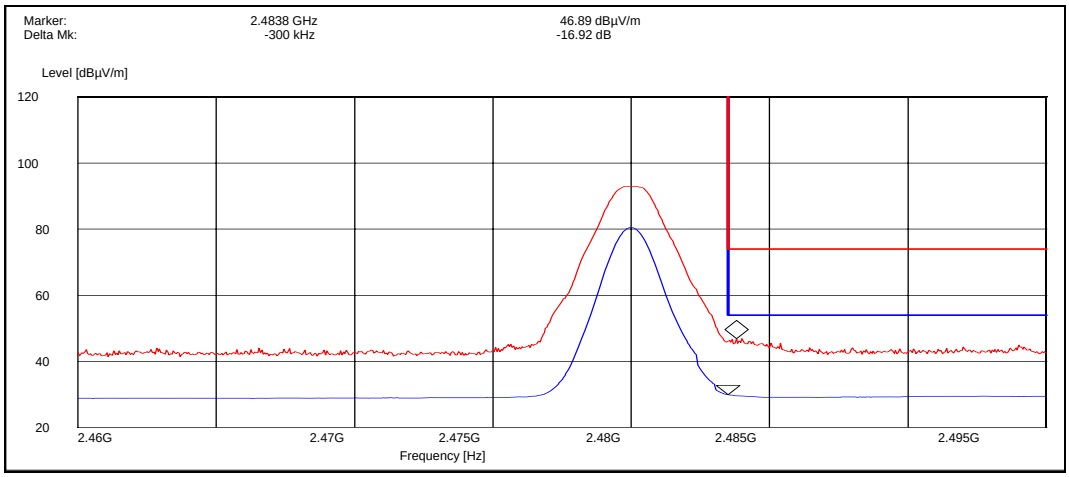
4.2.2 8DPSK modulation, PRBS packet type

Channel 0 / 2402 MHz



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	44.50	PASSED
Average	28.90	PASSED

Channel 78 / 2480 MHz



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	46.90	PASSED
Average	30.00	PASSED

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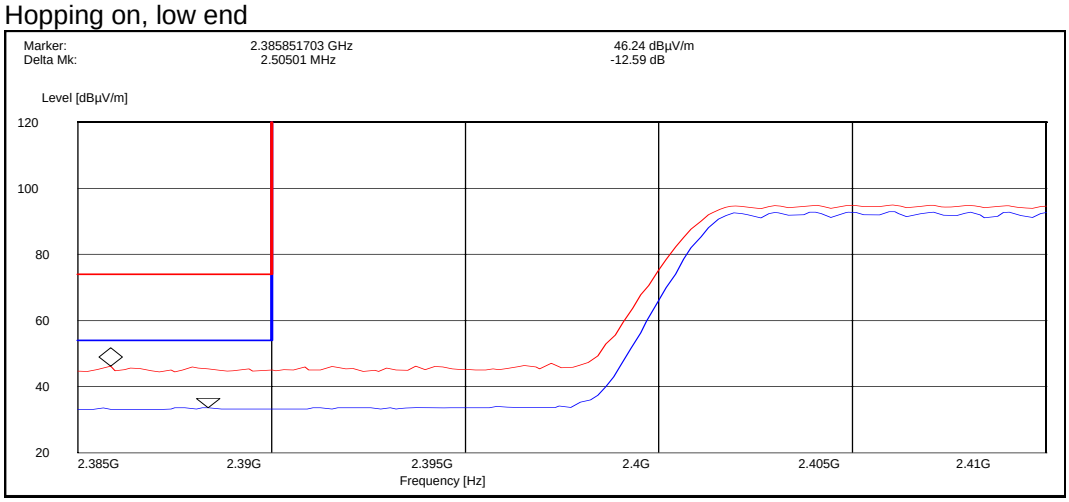
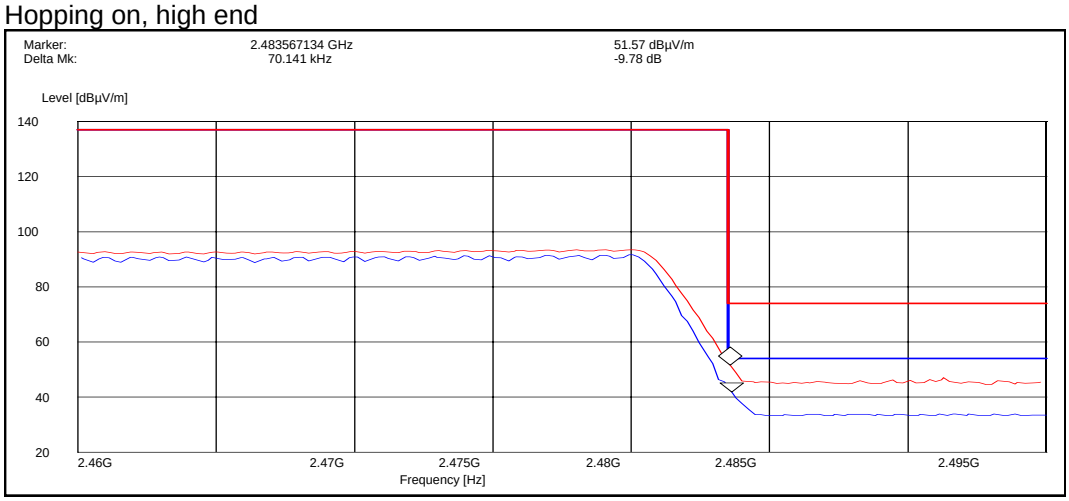
Hopping on, low end



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	46.20	PASSED
Average	33.60	PASSED

Hopping on, high end



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	51.60	PASSED
Average	41.80	PASSED

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5. Spurious RF conducted emissions

(FCC §15.247(d), RSS-A8.5)

EUT with DUT number	RM-333 DUT 41470
Accessories with DUT numbers	BL-5K DUT 41477 / AC-10E DUT 41478 / AD-54 DUT 41475 / HS-45 DUT 41473
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 102
Date of measurements	29-Apr-2008
Measured by	Petteri Suni

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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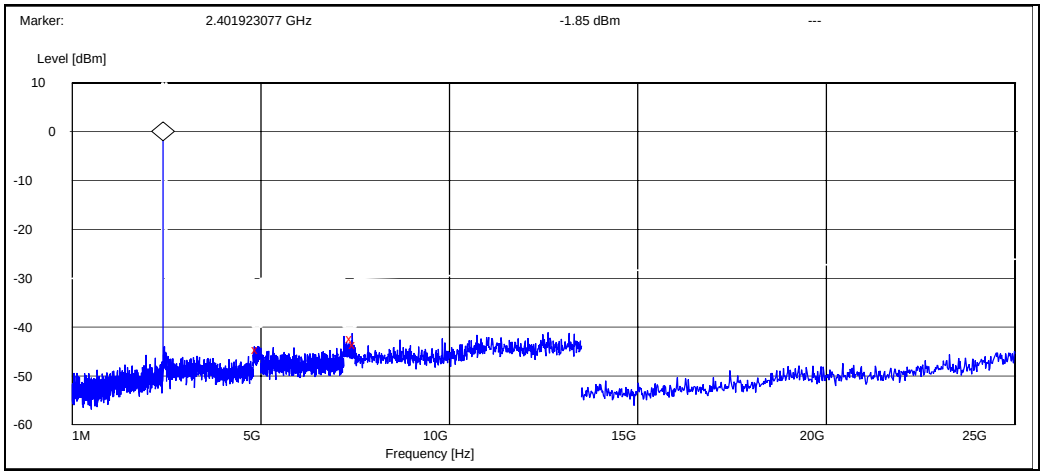
5.2. Bluetooth Test results

5.2.1 GFSK modulation, PRBS packet type

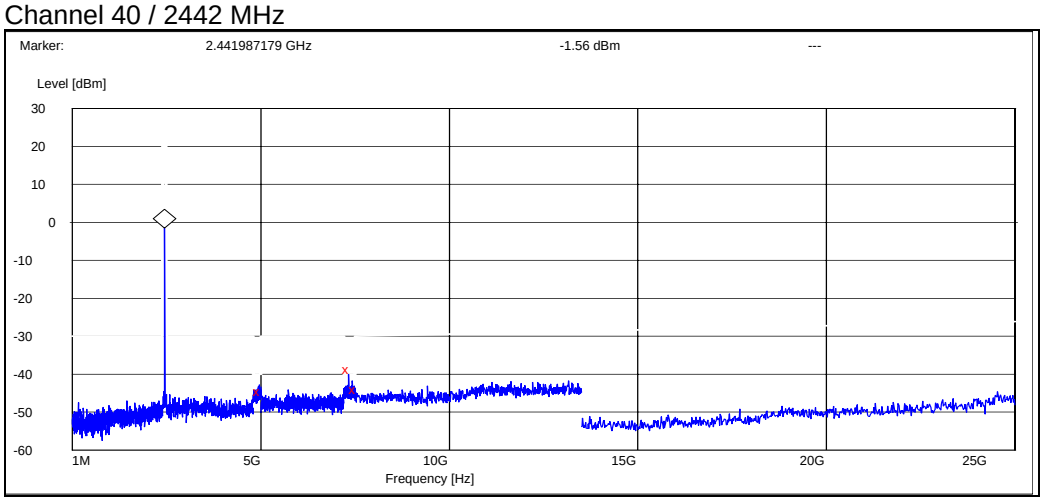
Channel 0 / 2402 MHz



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

Frequency [MHz]	P [dBc]	Result
4925.641026	-42.746853	PASSED
7421.153846	-40.546853	PASSED
7500.000000	-41.746853	PASSED

Channel 40 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4964.743590	-43.139783	PASSED
7326.442308	-37.339783	PASSED
7500.000000	-42.439783	PASSED

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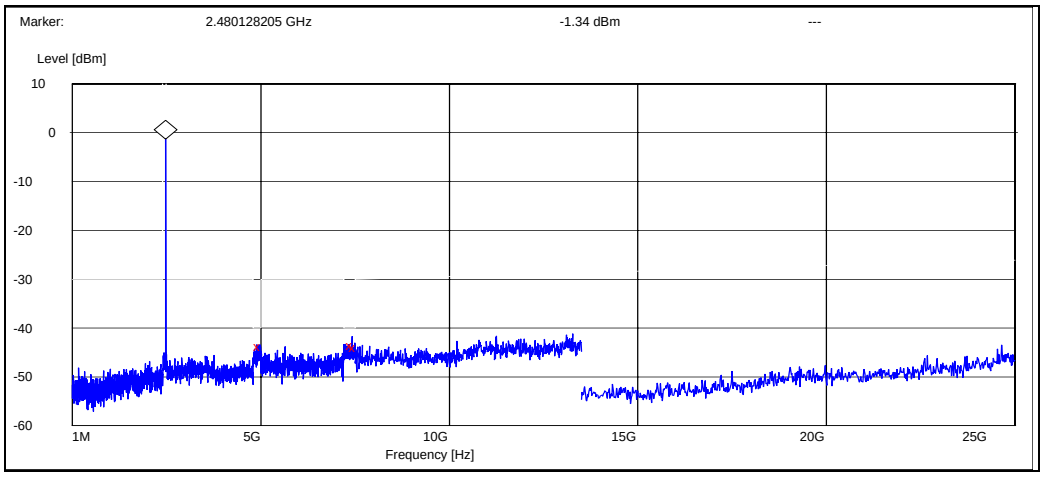
Channel 78 / 2480 MHz

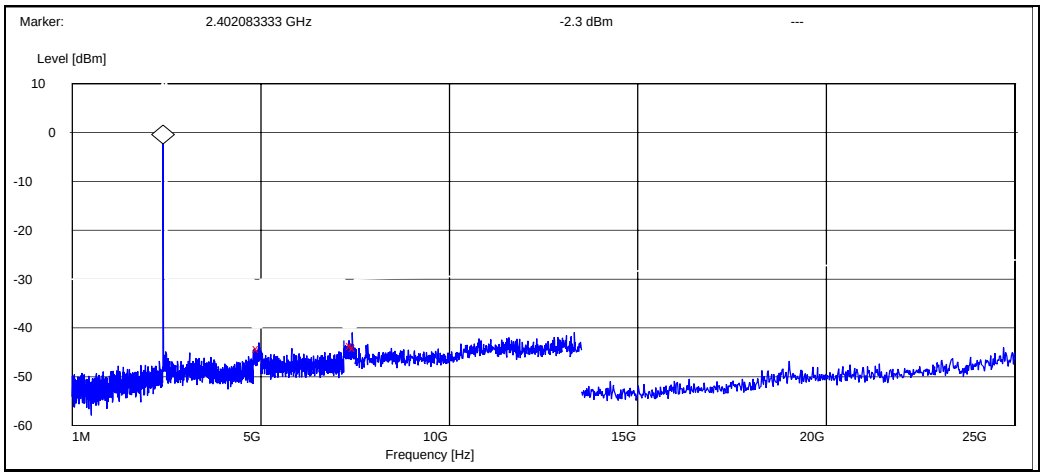


Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4981.089744	-42.456055	PASSED
7421.153846	-42.256055	PASSED
7500.000000	-42.556055	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
4953.846154	-42.004628	PASSED
7422.115385	-41.204628	PASSED
7500.000000	-41.804628	PASSED

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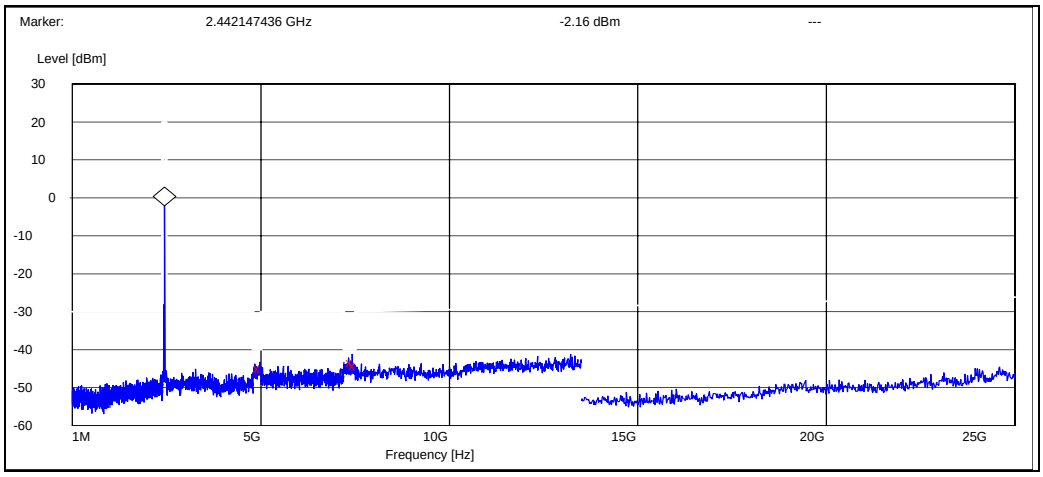
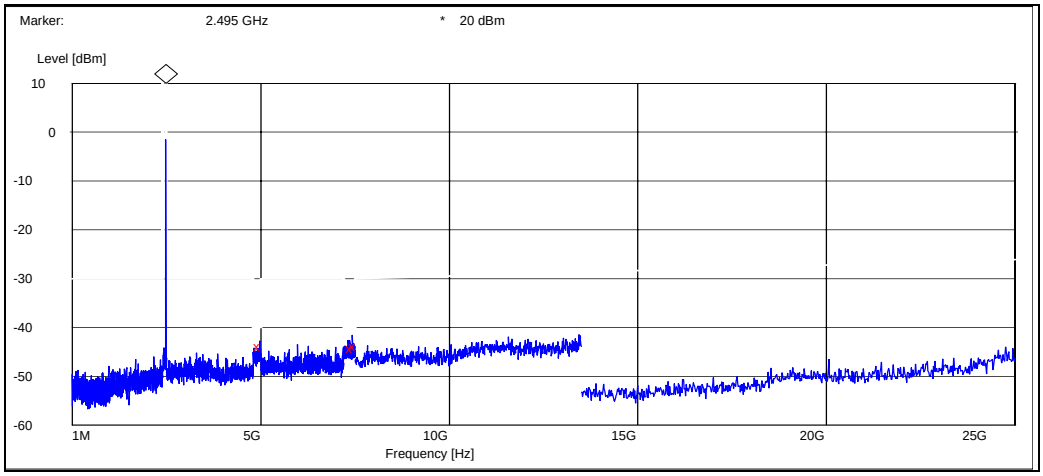
Channel 40 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4976.923077	-42.843783	PASSED
7422.115385	-41.243783	PASSED
7500.000000	-42.043783	PASSED

Channel 78 / 2480 MHz



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

Frequency [MHz]	P [dBc]	Result
4977.564103	-42.515232	PASSED
7422.115385	-42.915232	PASSED
7500.000000	-42.415232	PASSED

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6. Spurious radiated emissions

(FCC §15.247(d), §15.209, RSS-210 A8.5)

EUT with DUT number	RM-333 DUT 41471
Accessories with DUT numbers	BL-5K DUT 41477, AC-10E DUT 41478, AD-54 DUT 41475, HS-45 DUT 41473
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 48 / 101.5
Date of measurements	07-May-2008
Measured by	Jari Jantunen

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	42.60	134.90	44.40	-1.8	HORIZONTAL	PASSED
7206.000000	50.40	331.13	47.80	2.6	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	29.90	31.26	31.70	-1.8	HORIZONTAL	PASSED
7206.000000	36.60	67.61	34.00	2.6	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
37.676353	22.00	12.59	36.60	-14.6	VERTICAL	PASSED
73.746092	13.10	4.52	38.60	-25.5	HORIZONTAL	PASSED
75.069940	16.80	6.92	42.20	-25.4	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
4883.767535	41.50	118.85	43.30	-1.8	HORIZONTAL	PASSED
7326.151303	50.10	319.89	47.10	3.0	VERTICAL	PASSED
7326.153307	50.80	346.74	47.80	3.0	VERTICAL	PASSED
17899.795591	53.40	467.74	33.70	19.7	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
4883.767535	27.80	24.55	29.60	-1.8	HORIZONTAL	PASSED
7325.651303	36.90	69.98	33.90	3.0	VERTICAL	PASSED
7325.653307	36.30	65.31	33.30	3.0	VERTICAL	PASSED
17900.795591	40.60	107.15	20.90	19.7	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	42.30	130.32	43.60	-1.3	HORIZONTAL	PASSED
7440.000000	47.30	231.74	43.70	3.6	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
4960.000000	28.60	26.92	29.90	-1.3	HORIZONTAL	PASSED
7440.000000	34.30	51.88	30.70	3.6	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	42.20	128.82	44.00	-1.8	HORIZONTAL	PASSED
7206.000000	52.70	431.52	50.10	2.6	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	32.30	41.21	34.10	-1.8	HORIZONTAL	PASSED
7206.000000	41.10	113.50	38.50	2.6	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
37.676353	21.70	12.16	36.30	-14.6	VERTICAL	PASSED
74.808016	16.60	6.76	42.00	-25.4	HORIZONTAL	PASSED
75.169940	13.50	4.73	38.90	-25.4	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
4884.267535	42.20	128.82	44.00	-1.8	HORIZONTAL	PASSED
7326.151303	52.60	426.58	49.60	3.0	HORIZONTAL	PASSED
17994.987976	54.00	501.19	34.60	19.4	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
4884.267535	29.30	29.17	31.10	-1.8	HORIZONTAL	PASSED
7326.151303	42.00	125.89	39.00	3.0	HORIZONTAL	PASSED
17993.487976	40.40	104.71	21.00	19.4	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	41.80	123.03	43.10	-1.3	VERTICAL	PASSED
7440.000000	49.30	291.74	45.70	3.6	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
4960.000000	29.50	29.85	30.80	-1.3	VERTICAL	PASSED
7440.000000	37.20	72.44	33.60	3.6	VERTICAL	PASSED

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7. AC powerline conducted emissions

(FCC §15.207, RSS-GEN 7.2.2)

EUT with DUT number	RM-333 DUT 41471
Accessories with DUT numbers	BL-5K DUT 41477, AC-10E DUT 41478, AD-54 DUT 41475, HS-45 DUT 41473
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	19 / 44 / 101.5
Date of measurements	07-May-2008
Measured by	Jari Jantunen

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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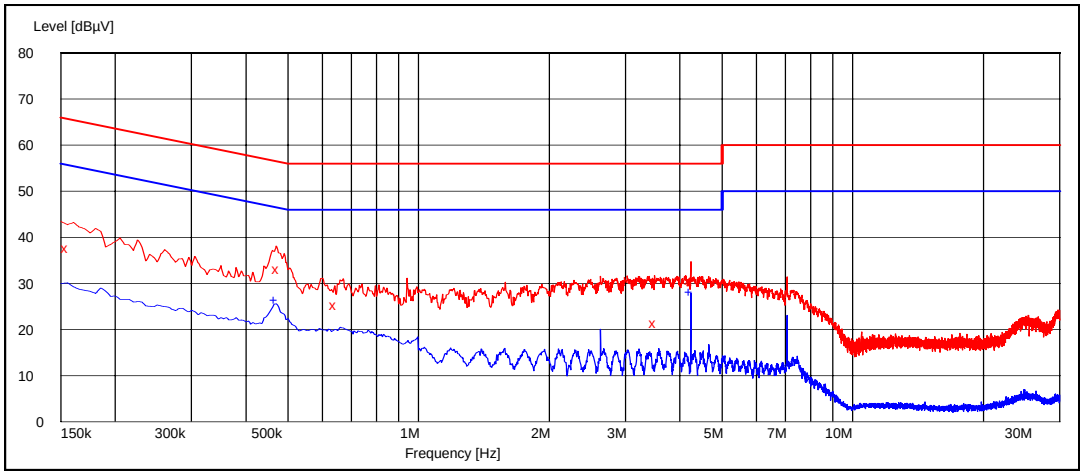
7.2. Bluetooth Test results

7.2.1 GFSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.155000	37.70	N	PASSED
0.475000	33.20	L1	PASSED
0.645000	25.20	L1	PASSED
3.515000	21.50	N	PASSED
4.240000	30.70	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.470000	26.30	L1	PASSED
4.240000	28.10	L1	PASSED

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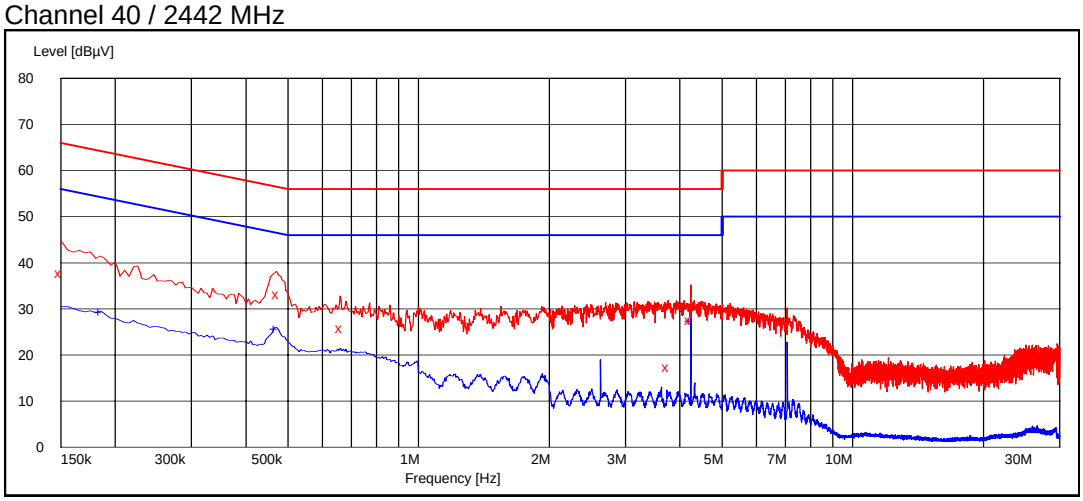
7.2.2 8DPSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.150000	37.80	N	PASSED
0.475000	33.30	L1	PASSED
0.665000	25.90	L1	PASSED
3.765000	17.40	N	PASSED
4.240000	27.60	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.185000	29.30	N	PASSED
0.470000	25.70	L1	PASSED
4.240000	27.40	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-333 DUT 41470
Accessories with DUT numbers	BL-5K DUT 41477 / AC-10E DUT 41478 / AD-54 DUT 41475 / HS-45 DUT 41473
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 102
Date of measurements	29-Apr-2008
Measured by	Petteri Suni

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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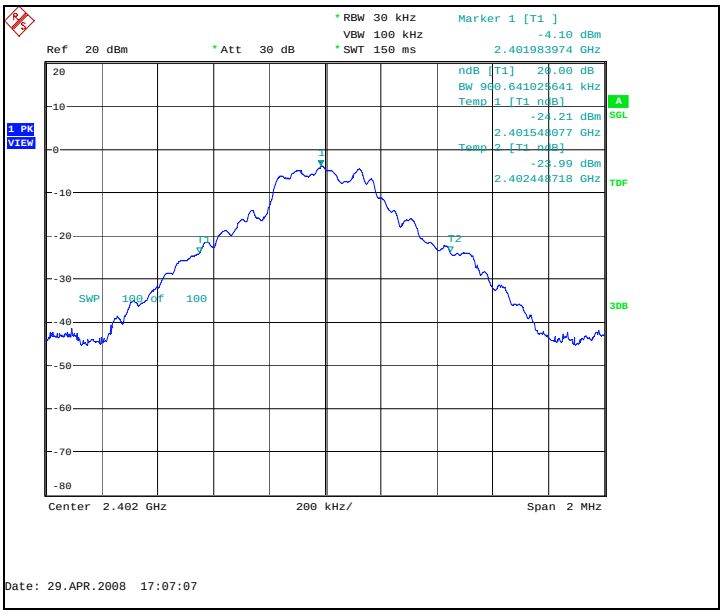
8.2. Bluetooth Test results

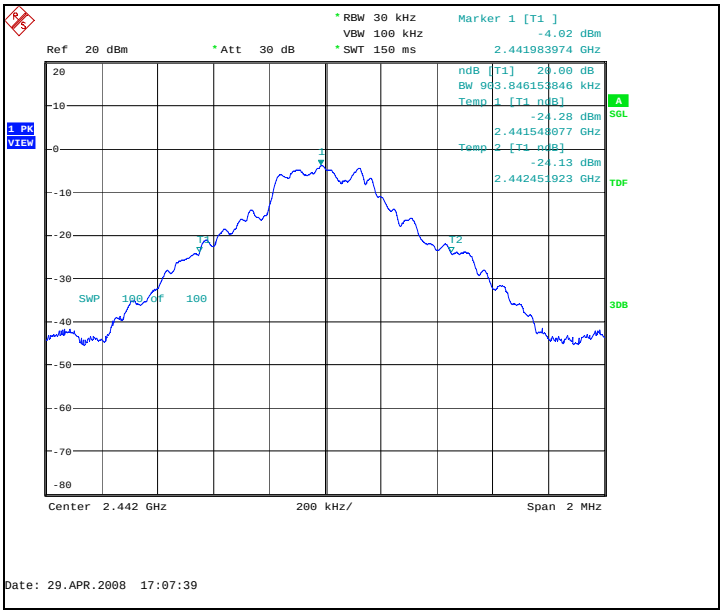
8.2.1 GFSK modulation, PRBS packet type

Channel / f_C [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	900.641	PASSED
40 / 2442	903.846	PASSED
78 / 2480	903.846	PASSED

Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



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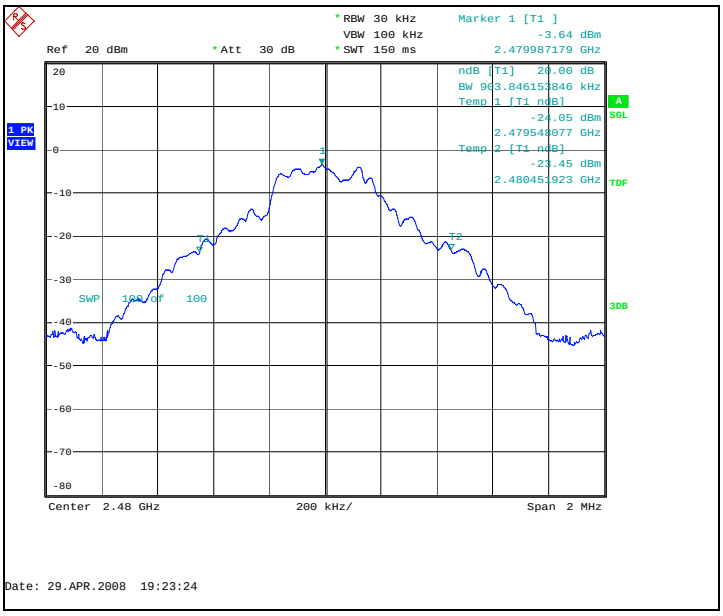
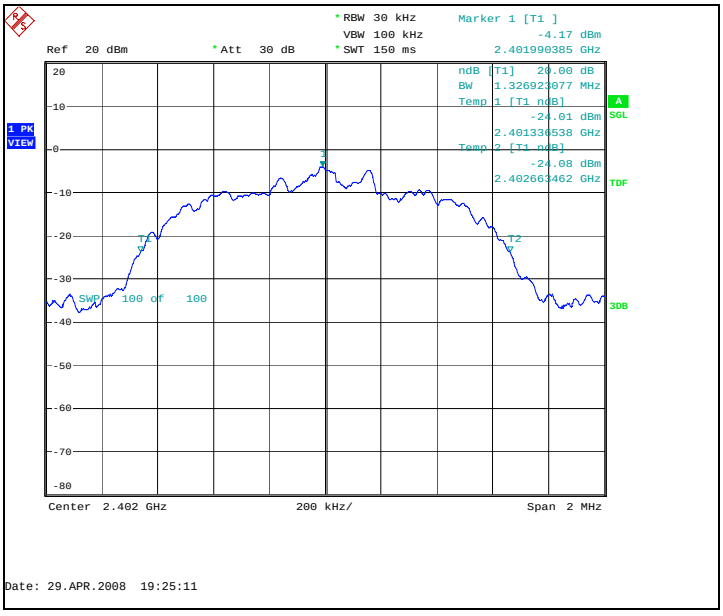
Channel 78 / 2480 MHz



8.2.2 8DPSK modulation, PRBS packet type

Channel / f_C [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	1326.923	PASSED
40 / 2442	1326.923	PASSED
78 / 2480	1323.718	PASSED

Channel 0 / 2402 MHz



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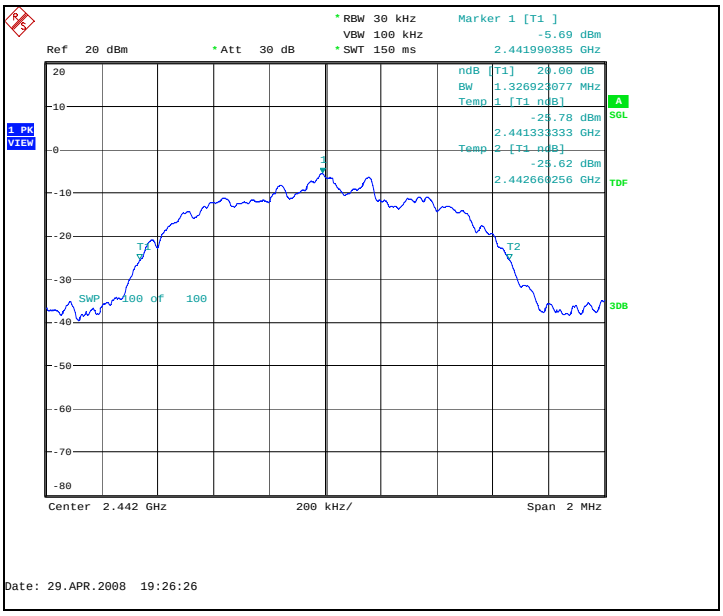
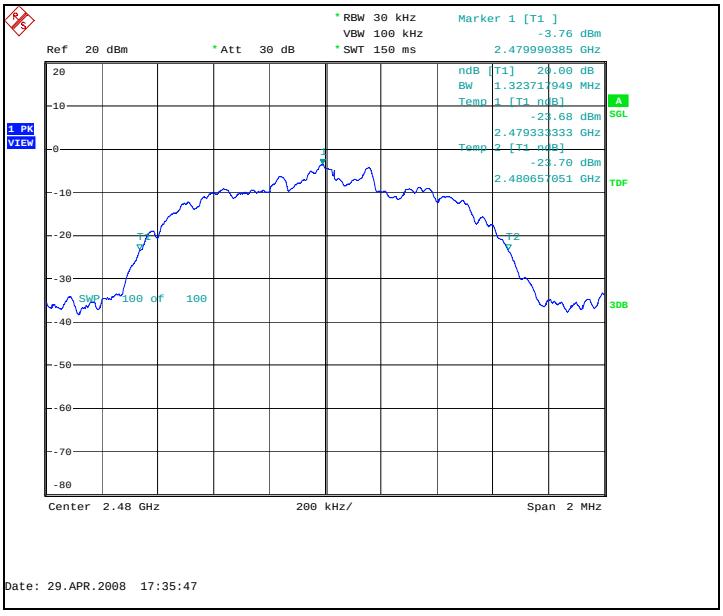
Channel 40 / 2442 MHz



Channel 78 / 2480 MHz



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9. Carrier frequency separation

(FCC §15.247(a)(1), RSS-210 A8.1 (2))

EUT with DUT number	RM-333 DUT 41470
Accessories with DUT numbers	BL-5K DUT 41477 / AC-10E DUT 41478 / AD-54 DUT 41475 / HS-45 DUT 41473
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 102
Date of measurements	29-Apr-2008
Measured by	Petteri Suni

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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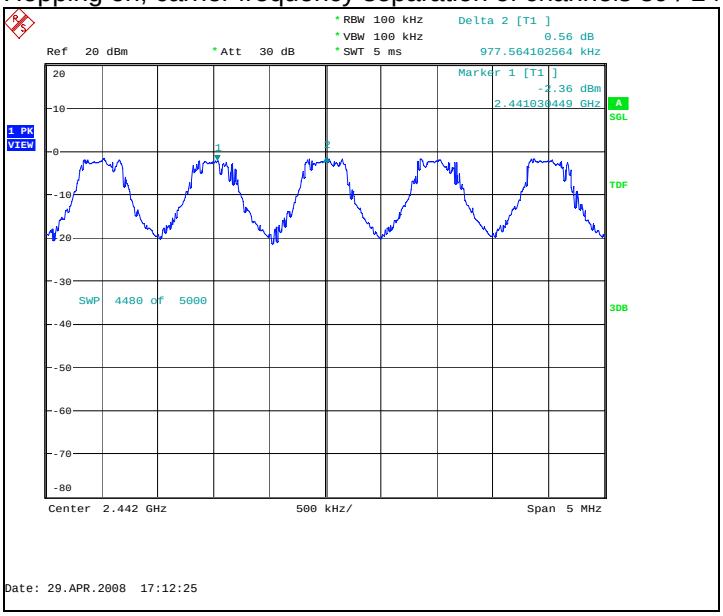
9.2. Bluetooth Test results

9.2.1 GFSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
977.564	PASSED

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



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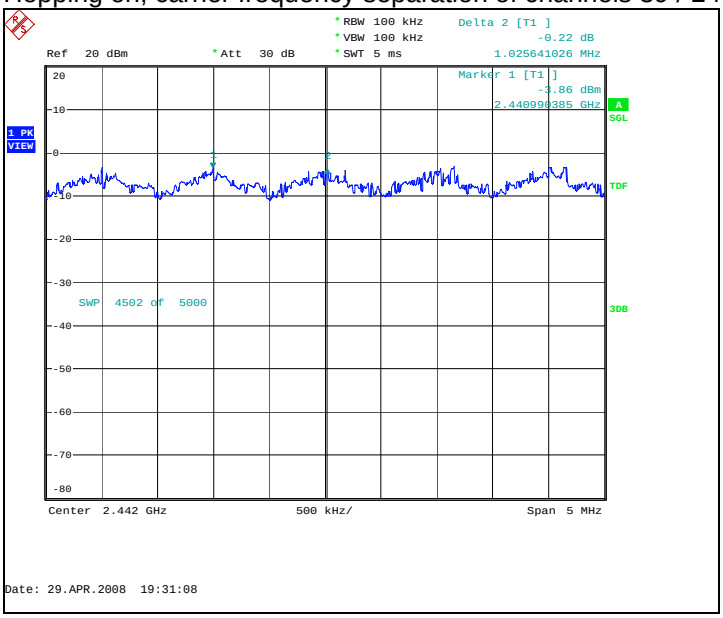
9.2.2 8DPSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
1025.641	PASSED

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



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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-333 DUT 41470
Accessories with DUT numbers	BL-5K DUT 41477 / AC-10E DUT 41478 / AD-54 DUT 41475 / HS-45 DUT 41473
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 102
Date of measurements	29-Apr-2008
Measured by	Petteri Suni

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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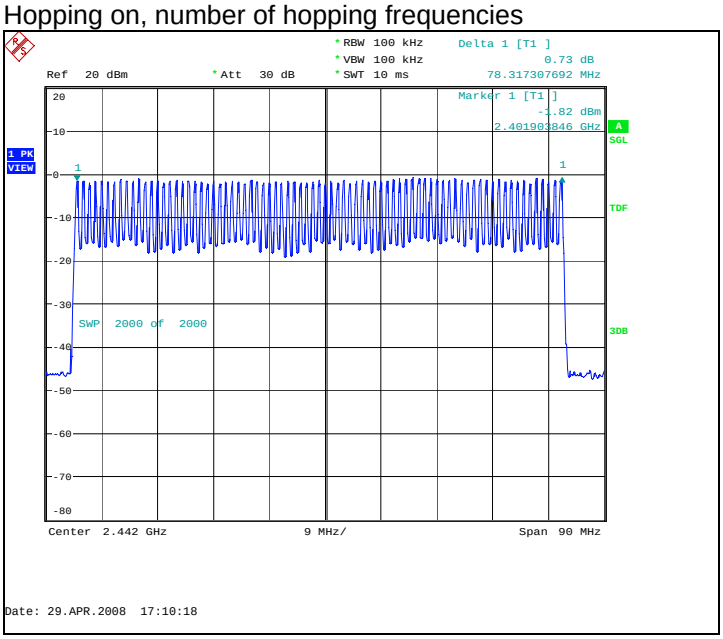
10.2. Bluetooth Test results

10.2.1 GFSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
79	PASSED

Hopping on, number of hopping frequencies



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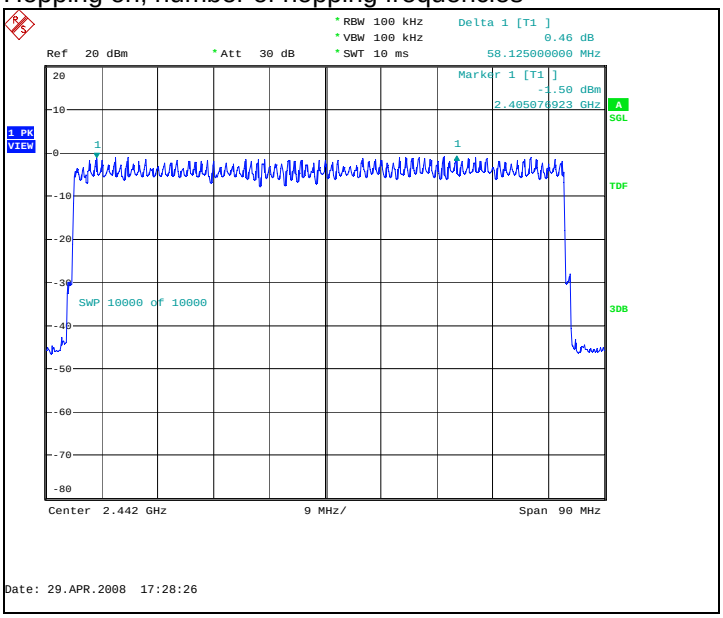
10.2.2 8DPSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
79	PASSED

Hopping on, number of hopping frequencies



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11. Time of occupancy

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

EUT with DUT number	RM-333 DUT 41470
Accessories with DUT numbers	BL-5K DUT 41477 / AC-10E DUT 41478 / AD-54 DUT 41475 / HS-45 DUT 41473
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 102
Date of measurements	29-Apr-2008
Measured by	Petteri Suni

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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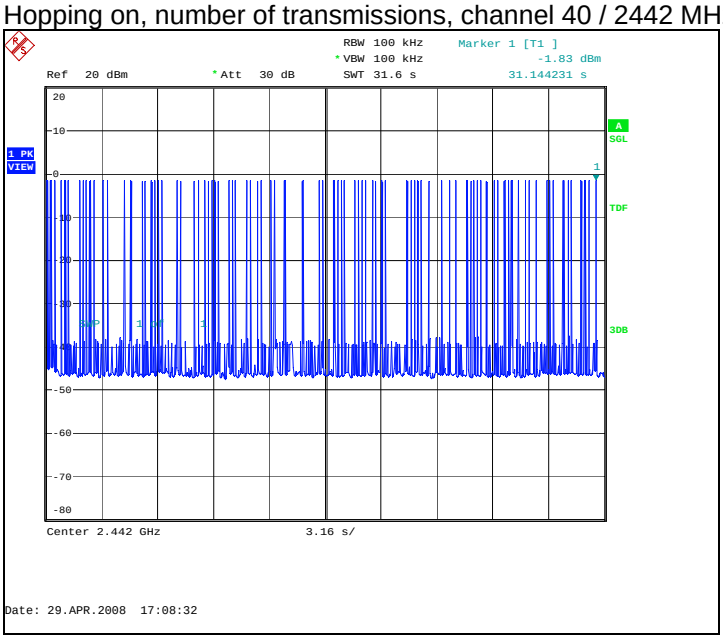
11.2. Bluetooth test results

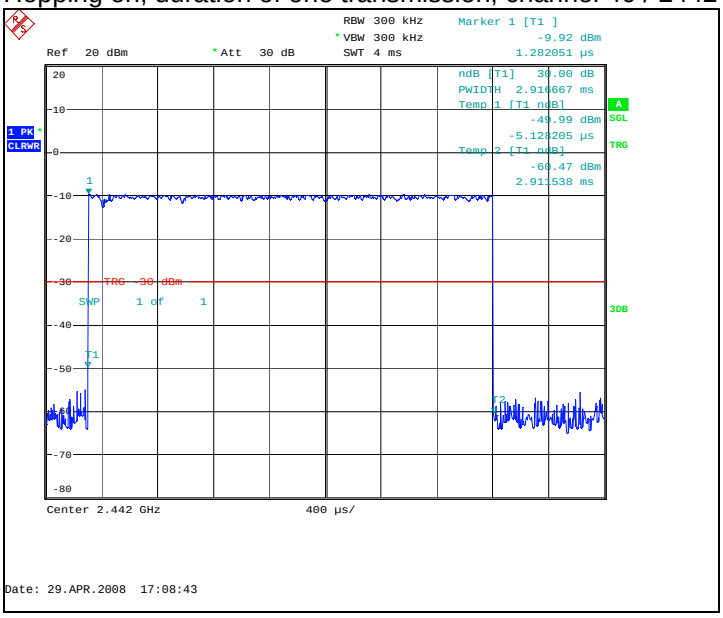
11.2.1 GFSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [µs]	Time of occupancy [s]	Result
90	2,917	0.262500	PASSED

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



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



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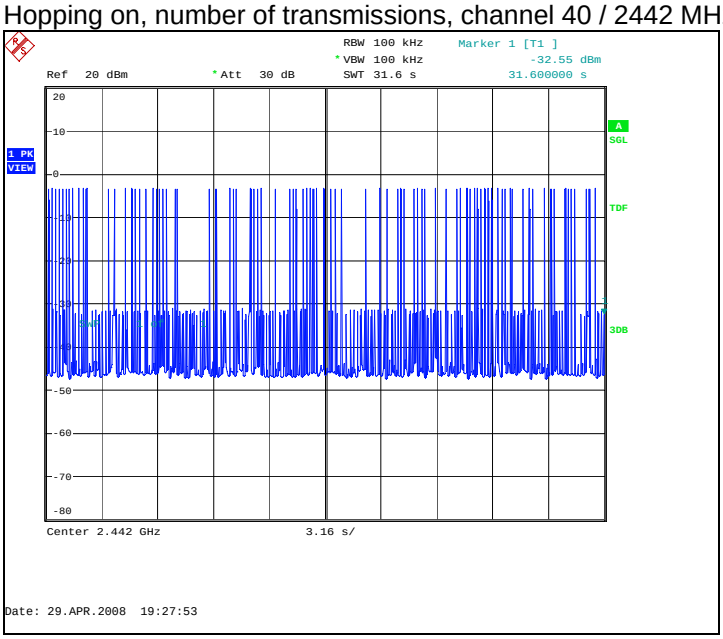
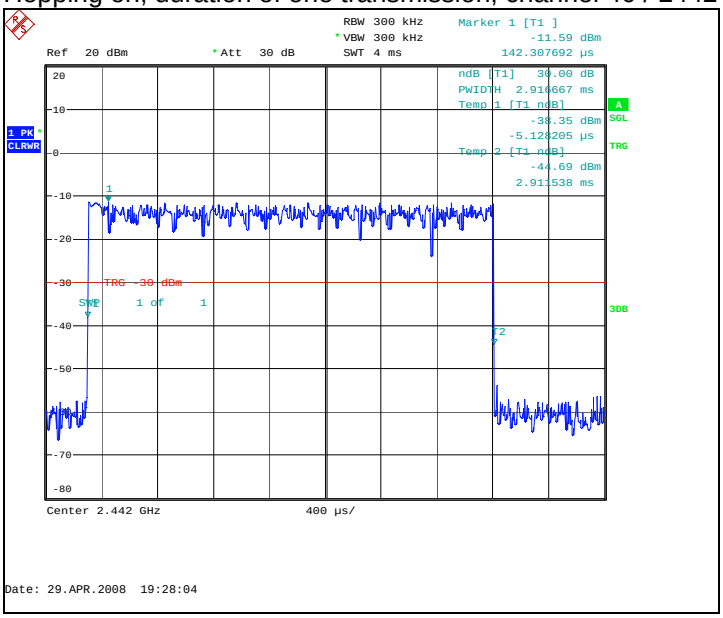
11.2.2 8DPSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [µs]	Time of occupancy [s]	Result
87	2,917	0.253750	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. Conducted peak output power

(FCC §15.247(b)(1), RSS-210 A8.4 (4))

EUT with DUT number	RM-333 DUT 41470
Accessories with DUT numbers	BL-5K DUT 41477 / AC-10E DUT 41478 / AD-54 DUT 41475 / HS-45 DUT 41473
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 102
Date of measurements	01-May-2008
Measured by	Petteri Suni

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

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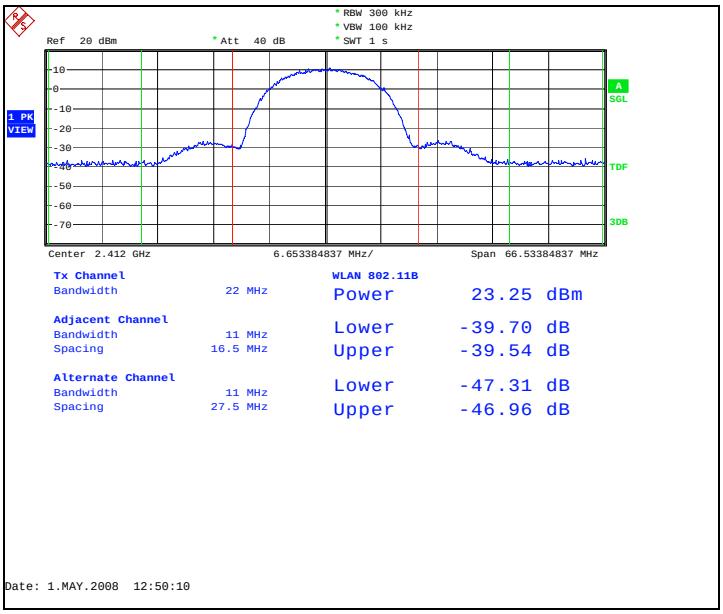
12.2. WLAN Test results

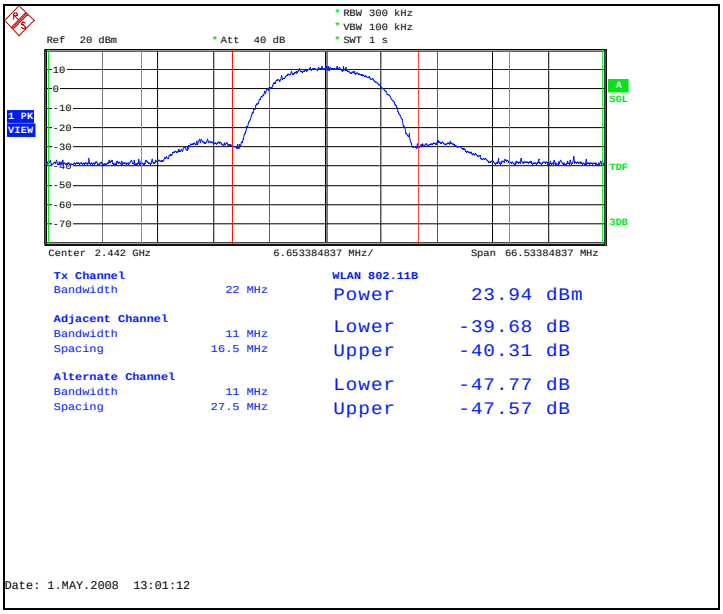
12.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_C [MHz]	P [dBm]	P [W]	Result
1 / 2412	23.25	0.211	PASSED
7 / 2442	23.94	0.248	PASSED
11 / 2462	23.76	0.238	PASSED

Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



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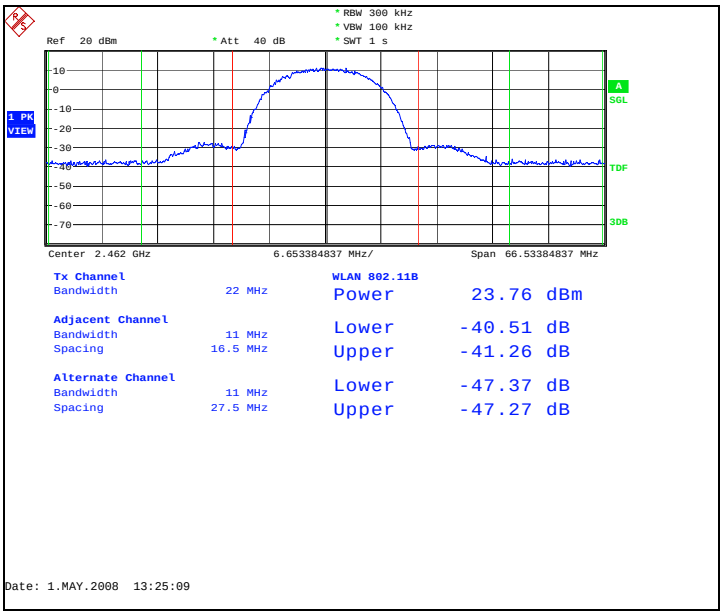
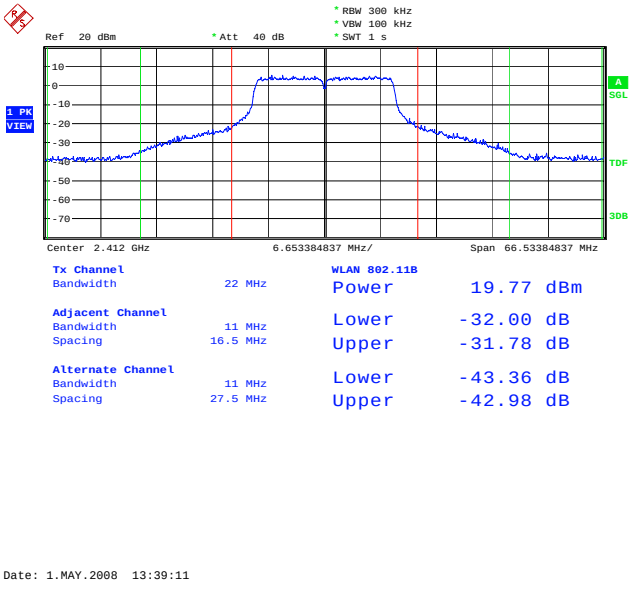
Channel 11 / 2462 MHz



12.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f_C [MHz]	P [dBm]	P [W]	Result
1 / 2412	19.77	0.095	PASSED
7 / 2442	22.25	0.168	PASSED
11 / 2462	20.29	0.107	PASSED

Channel 1 / 2412 MHz



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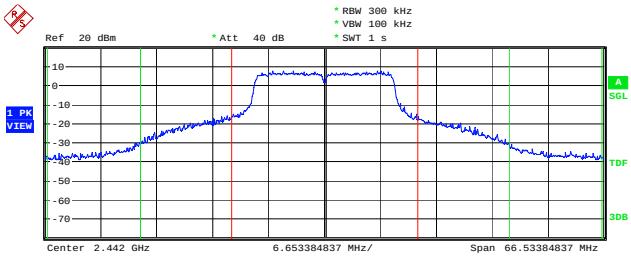
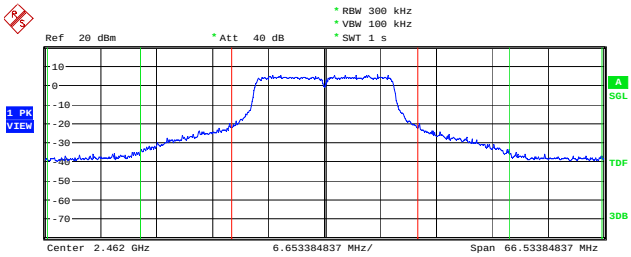
Channel 7 / 2442 MHz



Tx Channel		**WLAN 802.11B**	
Bandwidth	22 MHz	Power	22.25 dBm
Adjacent Channel			
Bandwidth	11 MHz	Lower	-28.75 dB
Spacing	16.5 MHz	Upper	-29.58 dB
Alternate Channel			
Bandwidth	11 MHz	Lower	-43.16 dB
Spacing	27.5 MHz	Upper	-43.34 dB

Date: 1.MAY.2008 13:51:56

Channel 11 / 2462 MHz



Tx Channel		**WLAN 802.11B**	
Bandwidth	22 MHz	Power	20.29 dBm
Adjacent Channel			
Bandwidth	11 MHz	Lower	-32.23 dB
Spacing	16.5 MHz	Upper	-33.01 dB
Alternate Channel			
Bandwidth	11 MHz	Lower	-43.49 dB
Spacing	27.5 MHz	Upper	-43.66 dB

Date: 1.MAY.2008 13:52:37

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13. Band edge compliance of RF emissions

(FCC §15.247(d), RSS-210 A8.5)

EUT with DUT number	RM-333 DUT 41471
Accessories with DUT numbers	BL-5K DUT 41477, AC-10E DUT 41478, AD-54 DUT 41475, HS-45 DUT 41473
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 49 / 101.6
Date of measurements	08-May-2008
Measured by	Jari Jantunen

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

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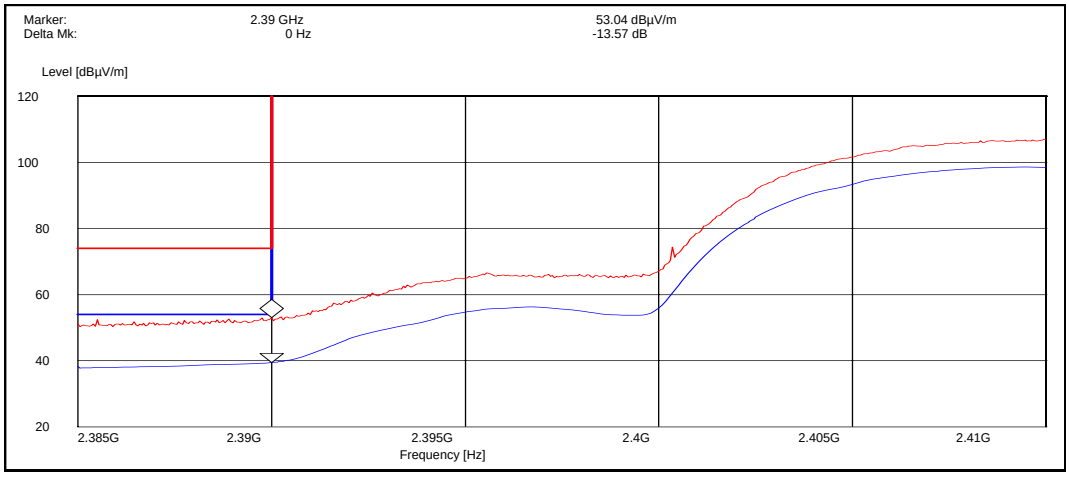
13.2. WLAN Test results

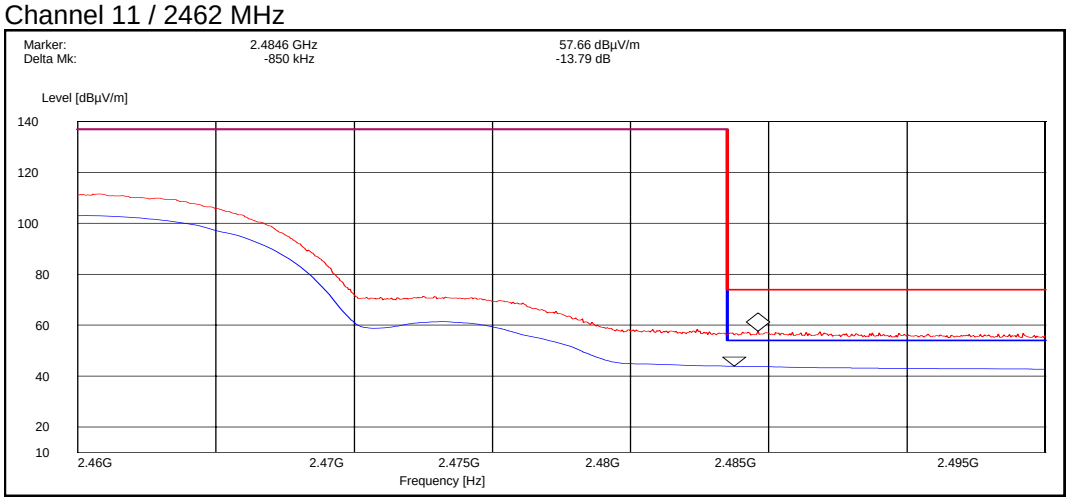
13.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 1 / 2412 MHz



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	53.00	PASSED
Average	39.50	PASSED

Channel 11 / 2462 MHz



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	57.66	PASSED
Average	43.87	PASSED

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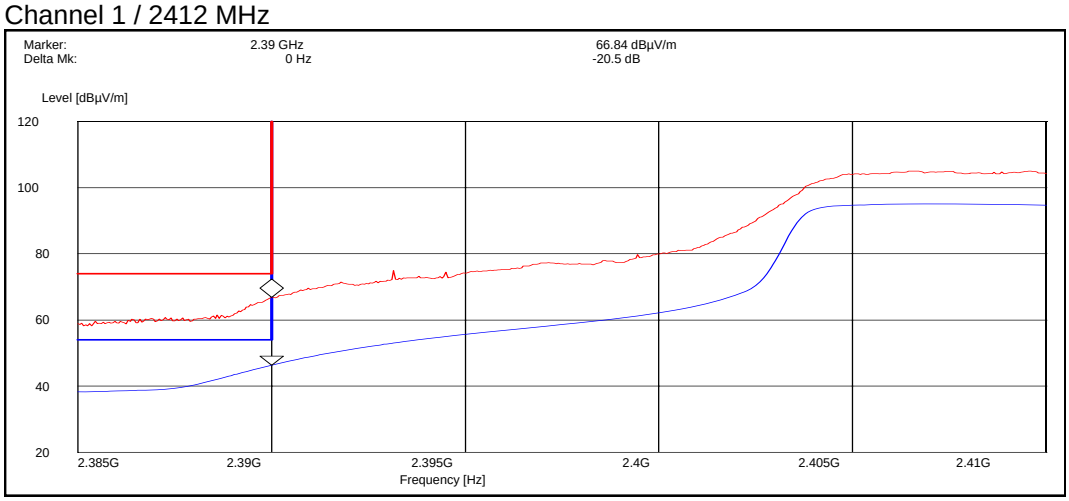
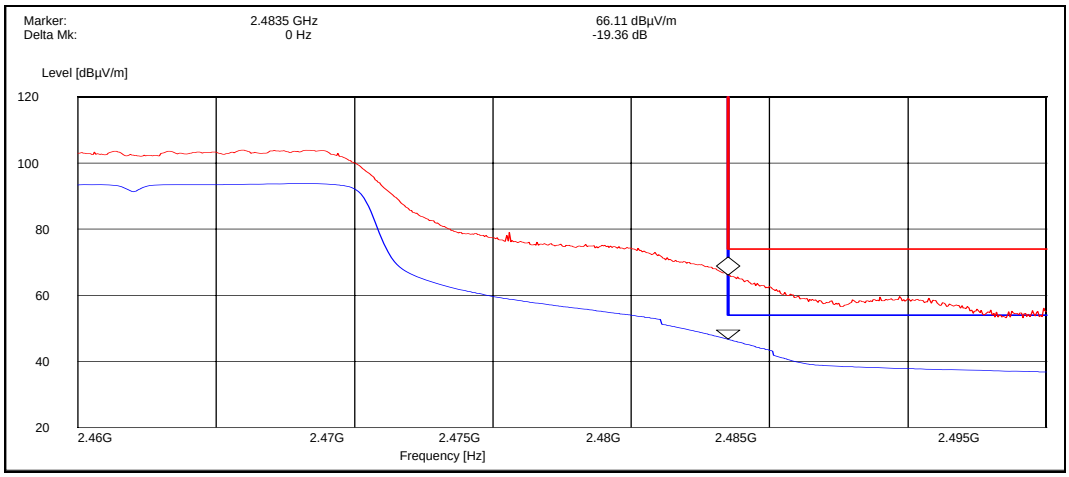
13.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 1 / 2412 MHz



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	66.80	PASSED
Average	46.30	PASSED

Channel 11 / 2462 MHz



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	66.10	PASSED
Average	46.80	PASSED

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14. Spurious RF conducted emissions

(FCC §15.247(d), RSS-210 A8.5)

EUT with DUT number	RM-333 DUT 41470
Accessories with DUT numbers	BL-5K DUT 41477 / AC-10E DUT 41478 / AD-54 DUT 41475 / HS-45 DUT 41473
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 102
Date of measurements	01-May-2008
Measured by	Petteri Suni

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

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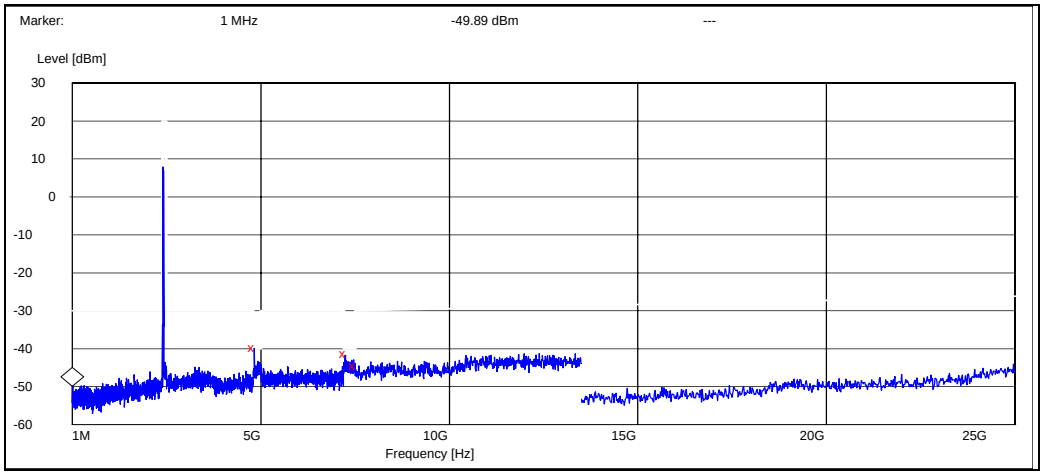
14.2. WLAN Test results

14.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

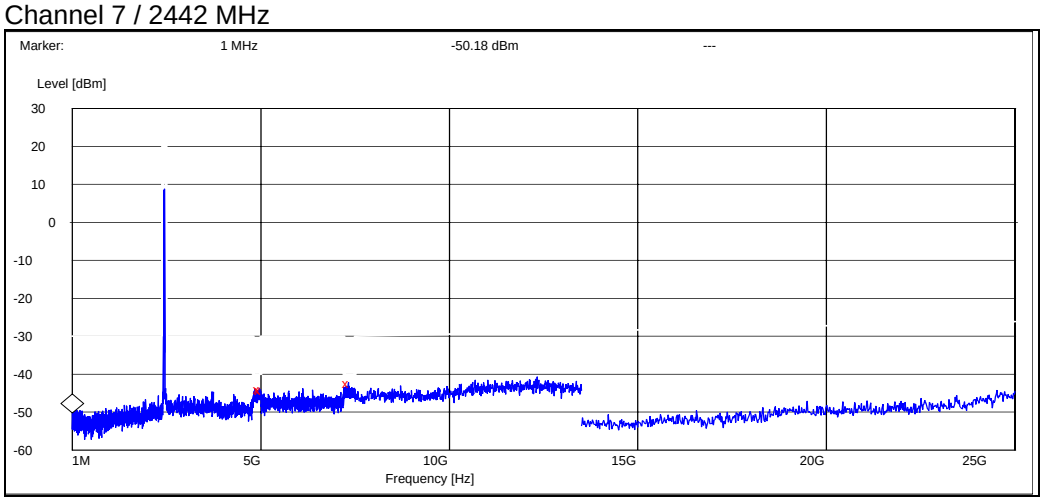
Channel 1 / 2412 MHz



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

Frequency [MHz]	P [dBc]	Result
4824.038462	-39.70	PASSED
7238.461538	-41.20	PASSED
7500.000000	-44.30	PASSED

Channel 7 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4967.307692	-45.78	PASSED
5000.000000	-40.00	PASSED
7327.403846	-42.47	PASSED

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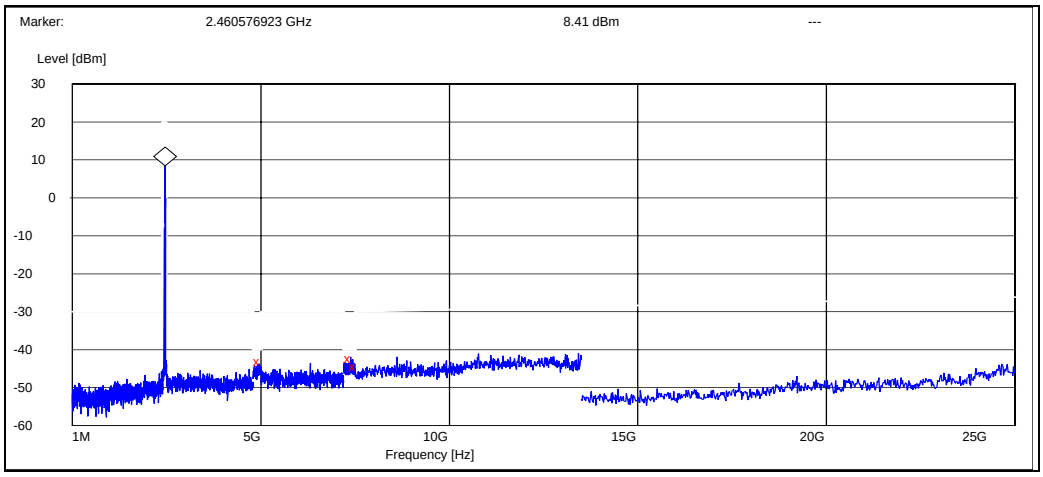
Channel 11 / 2462 MHz

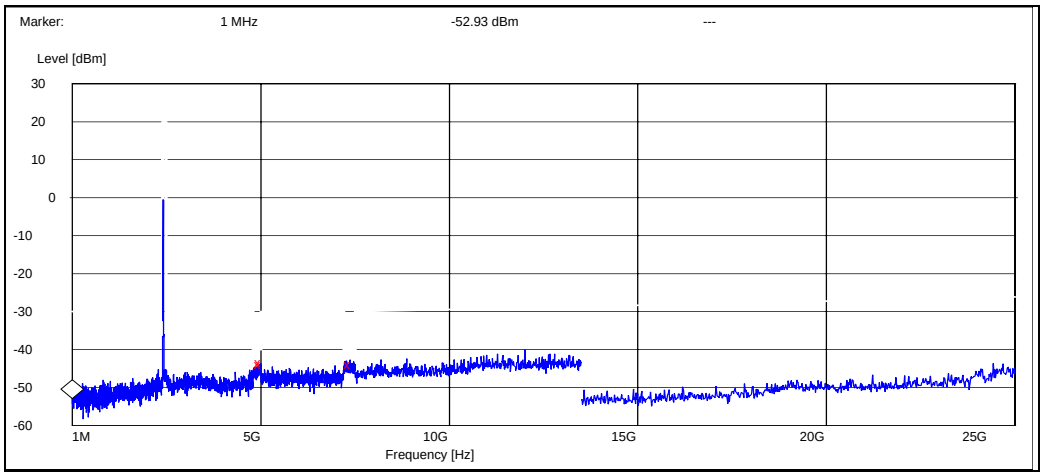


Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4957.692308	-51.611729	PASSED
7385.096154	-50.711729	PASSED
7500.000000	-52.811729	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
4930.769231	-46.649779	PASSED
7246.153846	-45.949779	PASSED
7500.000000	-47.049779	PASSED

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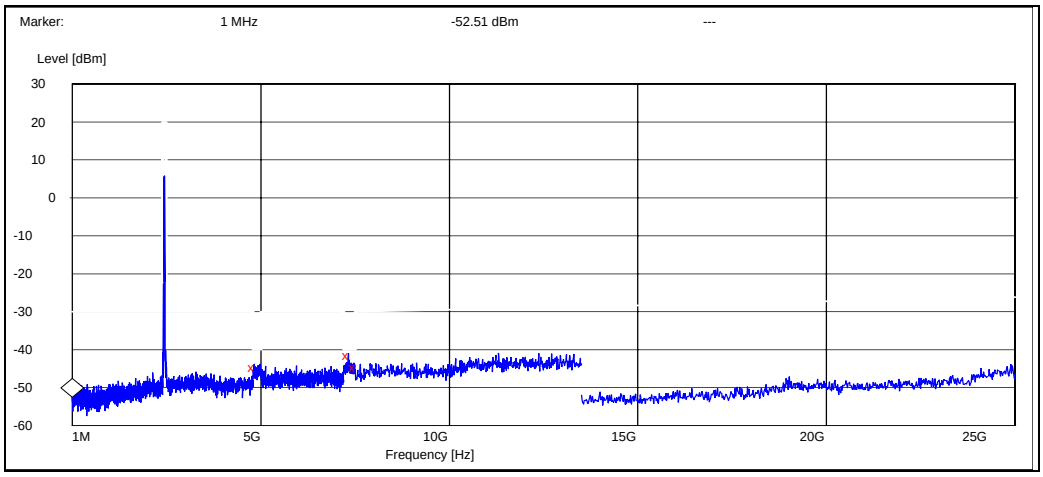
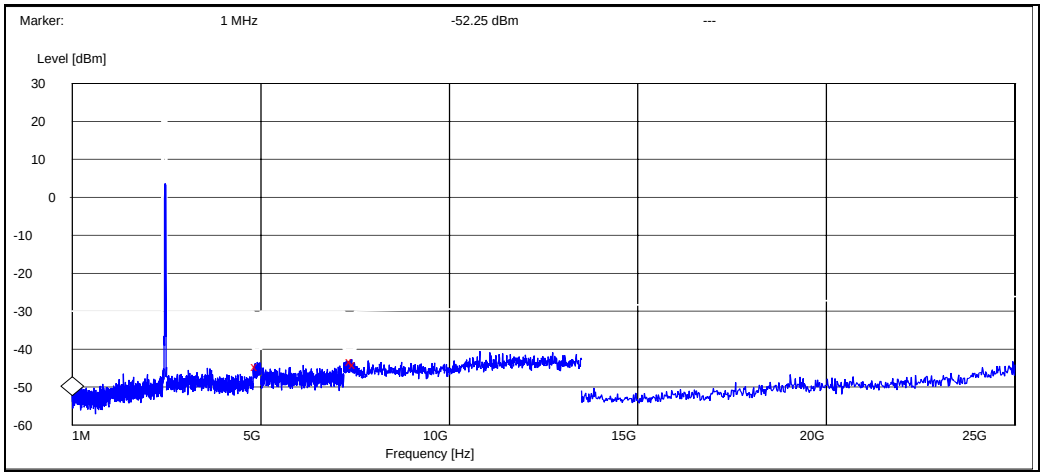
Channel 7 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4826.923077	-48.063805	PASSED
7335.096154	-47.563805	PASSED
7500.000000	-48.463805	PASSED

Channel 11 / 2462 MHz



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

Frequency [MHz]	P [dBc]	Result
4931.410256	-50.838134	PASSED
7320.673077	-48.038134	PASSED
7500.000000	-49.738134	PASSED

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15. Spurious radiated emissions

(FCC §15.247(d), §15.209, RSS-210 A8.5)

EUT with DUT number	RM-333 DUT 41471
Accessories with DUT numbers	BL-5K DUT 41477, AC-10E DUT 41478, AD-54 DUT 41475, HS-45 DUT 41473
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 49 / 101.6
Date of measurements	08-May-2008
Measured by	Jari Jantunen

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:

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

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

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 [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4824.000000	47.40	234.42	49.10	-1.7	HORIZONTAL	PASSED
7236.000000	43.10	142.89	40.50	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	28.20	25.70	29.90	-1.7	VERTICAL	PASSED
7236.000000	30.50	33.50	27.90	2.6	VERTICAL	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
37.995391	24.80	17.38	39.70	-14.9	VERTICAL	PASSED
75.088978	19.50	9.44	44.90	-25.4	HORIZONTAL	PASSED
75.169940	21.20	11.48	46.60	-25.4	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
4883.769539	55.90	623.73	57.70	-1.8	HORIZONTAL	PASSED
7326.151303	51.60	380.19	48.60	3.0	VERTICAL	PASSED
7327.653307	50.60	338.84	47.60	3.0	VERTICAL	PASSED
17981.957916	53.70	484.17	34.30	19.4	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
4884.269539	44.00	158.49	45.80	-1.8	HORIZONTAL	PASSED
7325.651303	38.90	88.10	35.90	3.0	VERTICAL	PASSED
7325.653307	38.80	87.10	35.80	3.0	VERTICAL	PASSED
17981.957916	40.50	105.93	21.10	19.4	HORIZONTAL	PASSED

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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	48.30	260.02	50.10	-1.8	HORIZONTAL	PASSED
7386.000000	62.20	1 288.25	58.70	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	35.70	60.95	37.50	-1.8	HORIZONTAL	PASSED
7386.000000	52.00	398.11	48.50	3.5	VERTICAL	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	50.60	338.84	52.30	-1.7	HORIZONTAL	PASSED
7236.000000	55.70	609.54	53.10	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	38.90	88.10	40.60	-1.7	HORIZONTAL	PASSED
7236.000000	37.70	76.74	35.10	2.6	VERTICAL	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
37.795391	29.20	28.84	43.90	-14.7	VERTICAL	PASSED
73.346092	23.20	14.45	48.80	-25.6	HORIZONTAL	PASSED
75.169940	24.50	16.79	49.90	-25.4	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
4885.769539	56.30	653.13	58.10	-1.8	HORIZONTAL	PASSED
4886.265531	55.80	616.60	57.60	-1.8	HORIZONTAL	PASSED
7321.651303	56.80	691.83	53.80	3.0	VERTICAL	PASSED
7326.157315	56.00	630.96	53.00	3.0	VERTICAL	PASSED
17932.363727	54.20	512.86	34.70	19.5	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
4885.765531	41.80	123.03	43.60	-1.8	HORIZONTAL	PASSED
4885.769539	41.60	120.23	43.40	-1.8	HORIZONTAL	PASSED
7321.651303	40.50	105.93	37.50	3.0	VERTICAL	PASSED
7330.657315	39.40	93.33	36.40	3.0	VERTICAL	PASSED
17934.863727	40.30	103.51	20.80	19.5	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	52.70	431.52	54.50	-1.8	HORIZONTAL	PASSED
7386.000000	51.90	393.55	48.40	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	40.20	102.33	42.00	-1.8	HORIZONTAL	PASSED
7386.000000	36.00	63.10	32.50	3.5	VERTICAL	PASSED

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16. AC powerline conducted emissions

(FCC §15.207, RSS-GEN 7.2.2)

EUT with DUT number	RM-333 DUT 41471
Accessories with DUT numbers	BL-5K DUT 41477, AC-10E DUT 41478, AD-54 DUT 41475, HS-45 DUT 41473
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	19 / 44 / 101.5
Date of measurements	07-May-2008
Measured by	Jari Jantunen

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

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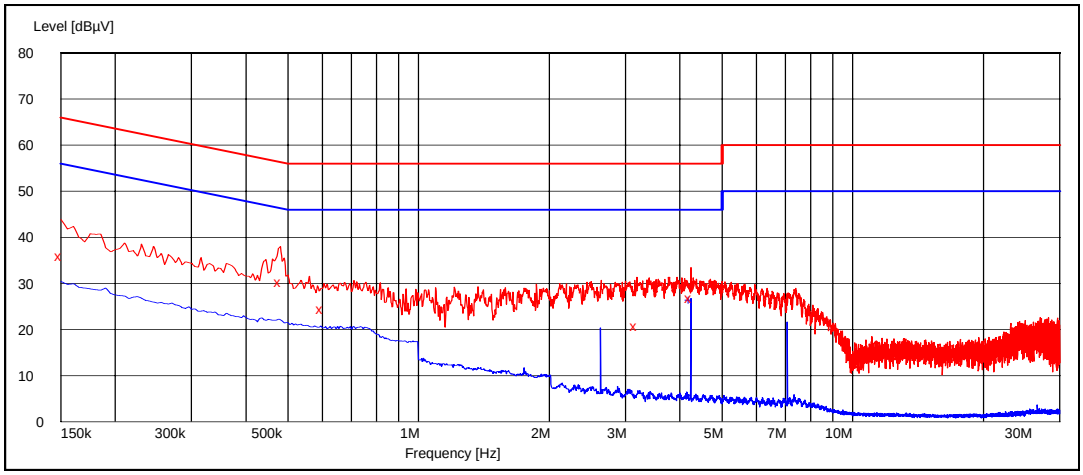
16.2. WLAN Test results

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
0.150000	35.90	N	PASSED
0.480000	30.40	L1	PASSED
0.600000	24.40	L1	PASSED
3.175000	20.80	L1	PASSED
4.240000	26.80	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
4.240000	26.40	N	PASSED

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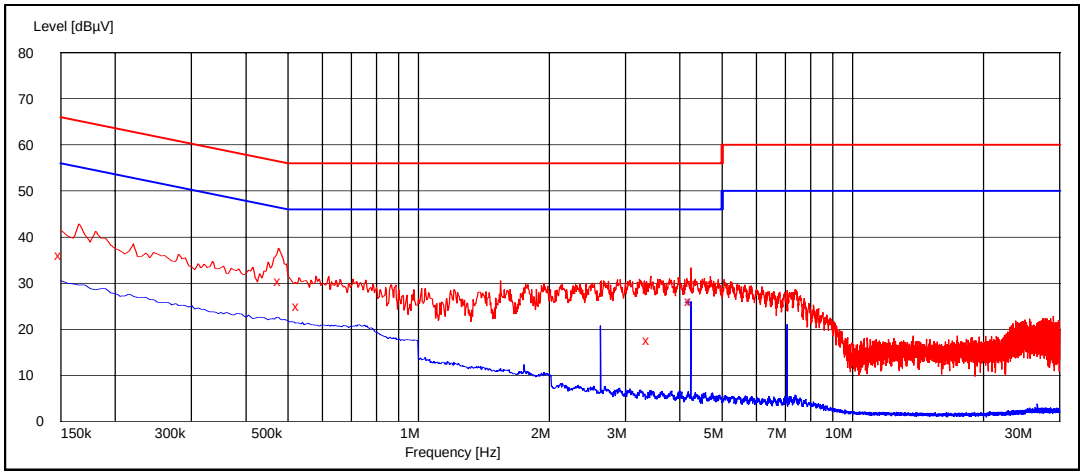
16.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate



Channel 7 / 2442 MHz

Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.150000	36.00	L1	PASSED
0.480000	30.50	L1	PASSED
0.530000	25.00	N	PASSED
3.400000	17.60	N	PASSED
4.240000	26.10	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
4.240000	25.90	L1	PASSED

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17. 6 dB bandwidth

(FCC §15.247(a)(2), RSS-210 A8.2 (1))

EUT with DUT number	RM-333 DUT 41470
Accessories with DUT numbers	BL-5K DUT 41477 / AC-10E DUT 41478 / AD-54 DUT 41475 / HS-45 DUT 41473
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 102
Date of measurements	01-May-2008
Measured by	Petteri Suni

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

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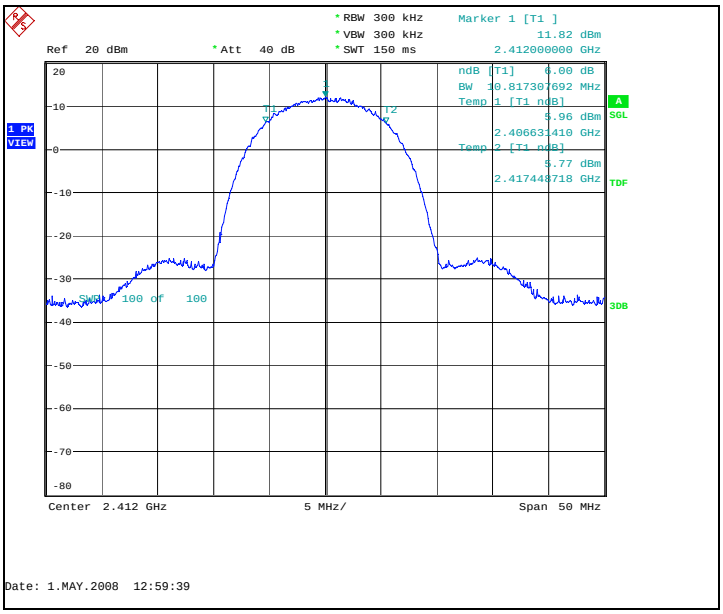
17.2. WLAN test results

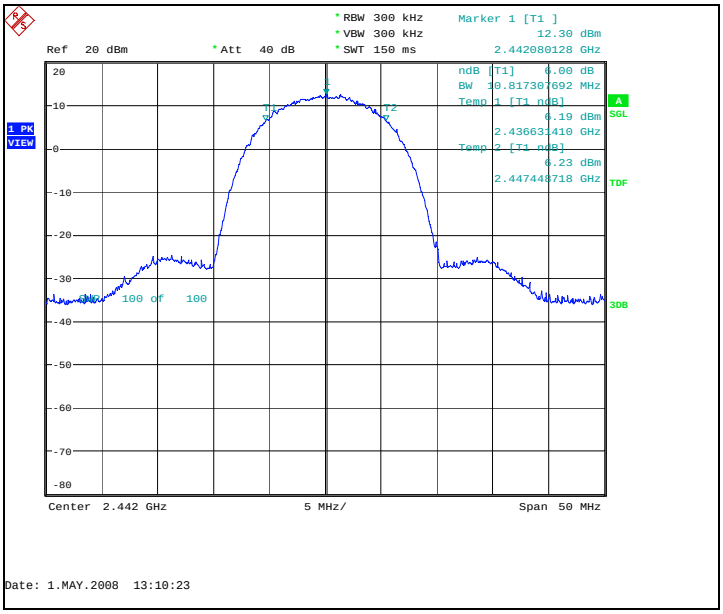
17.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_C [MHz]	6 dB bandwidth [kHz]	Result
1	10817.308	PASSED
7	10817.308	PASSED
11	10897.436	PASSED

Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



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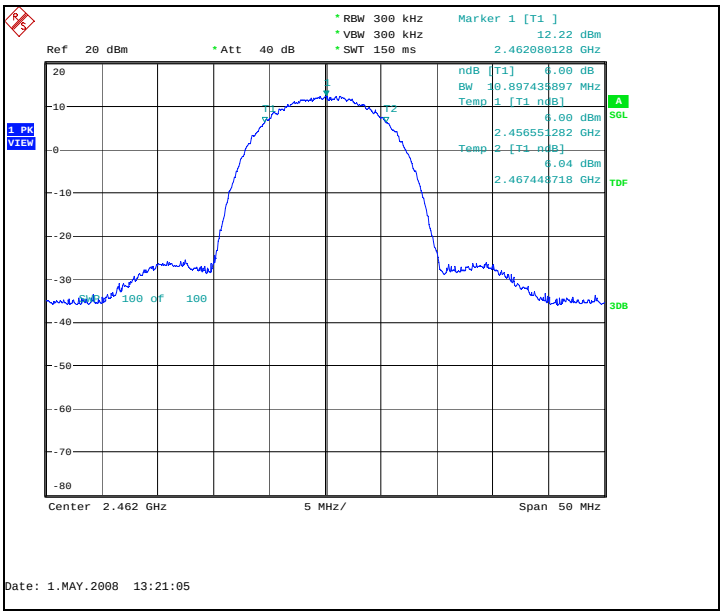
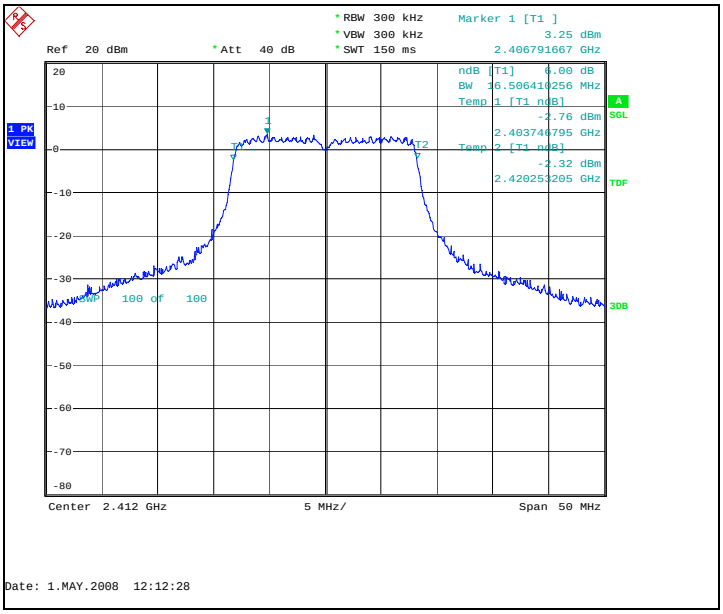
Channel 11 / 2462 MHz



17.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f_C [MHz]	6 dB bandwidth [kHz]	Result
1	16506.410	PASSED
7	16506.410	PASSED
11	16506.410	PASSED

Channel 1 / 2412 MHz



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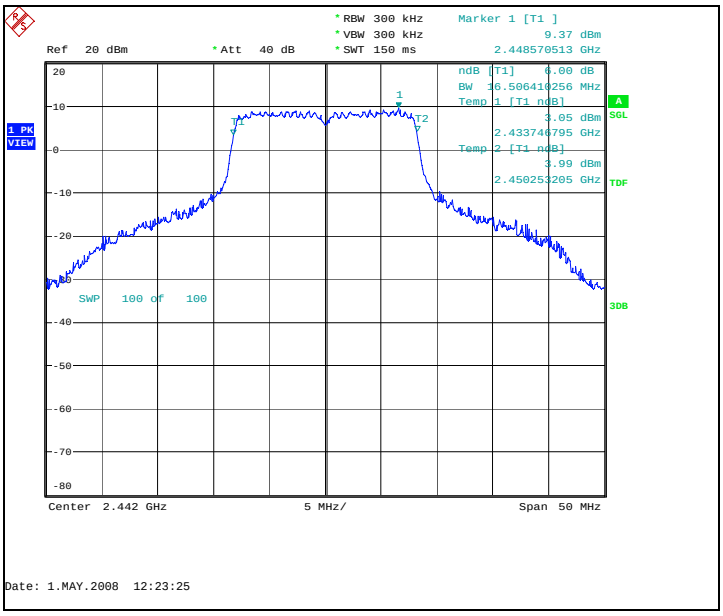
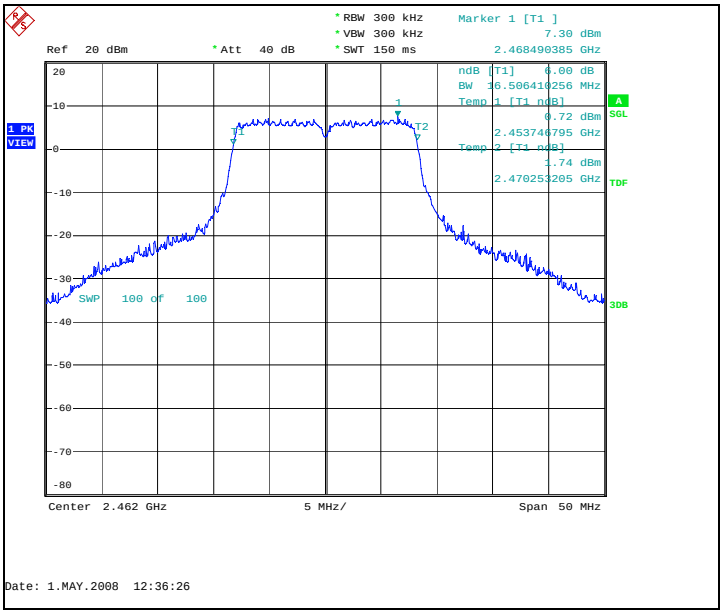
Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



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18. Power spectral density

(FCC §15.247(e), RSS-210 A8.2 (2))

EUT with DUT number	RM-333 DUT 41470
Accessories with DUT numbers	BL-5K DUT 41477 / AC-10E DUT 41478 / AD-54 DUT 41475 / HS-45 DUT 41473
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 102
Date of measurements	01-May-2008
Measured by	Petteri Suni

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

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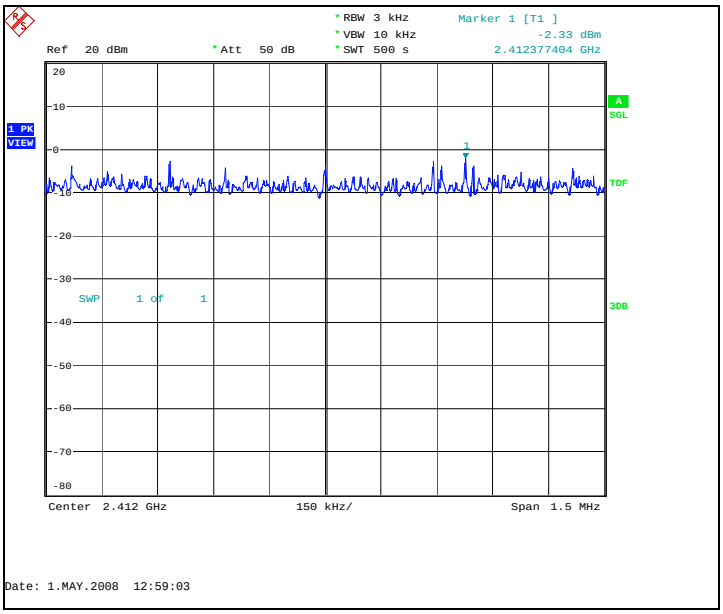
18.2. WLAN test results

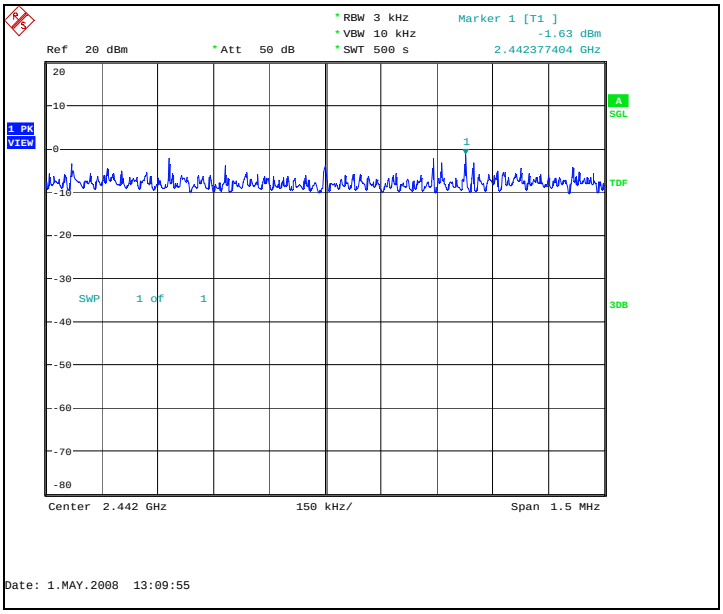
18.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_C [MHz]	P [dBm]	Result
1 / 2412	-2.33	PASSED
7 / 2442	-1.63	PASSED
11 / 2462	-1.71	PASSED

Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



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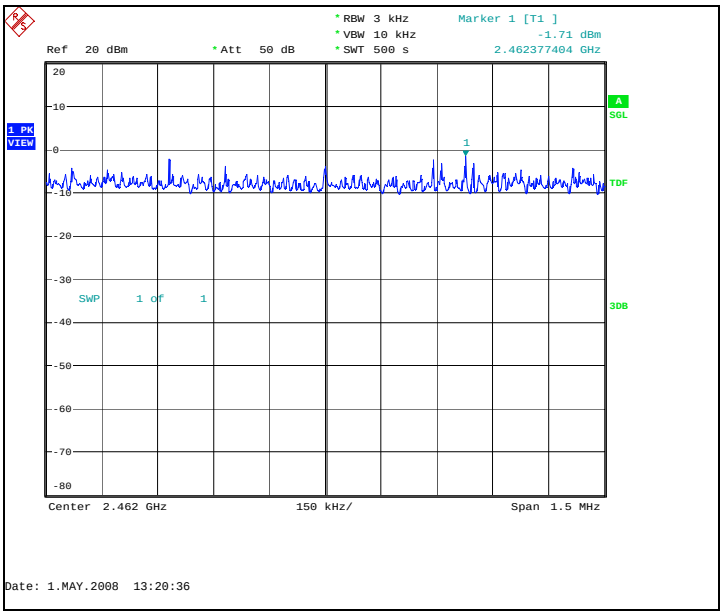
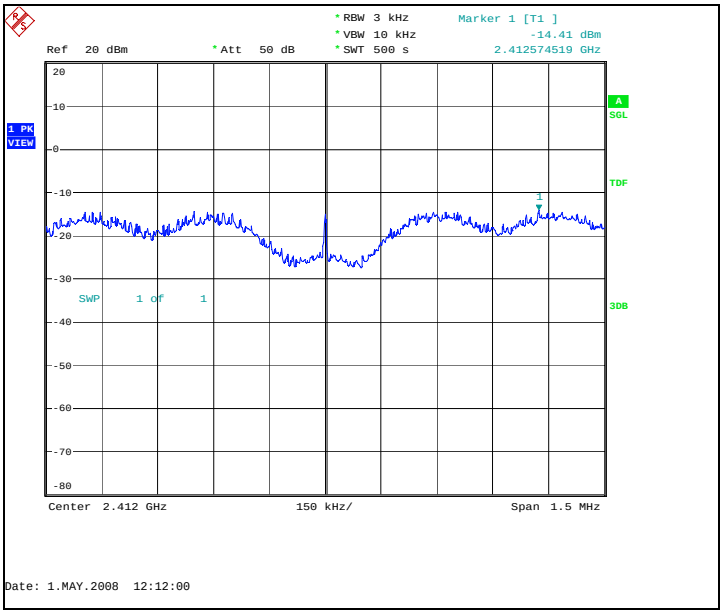
Channel 11 / 2462 MHz



18.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f_C [MHz]	P [dBm]	Result
1 / 2412	-14.41	PASSED
7 / 2442	-8.35	PASSED
11 / 2462	-10.14	PASSED

Channel 1 / 2412 MHz



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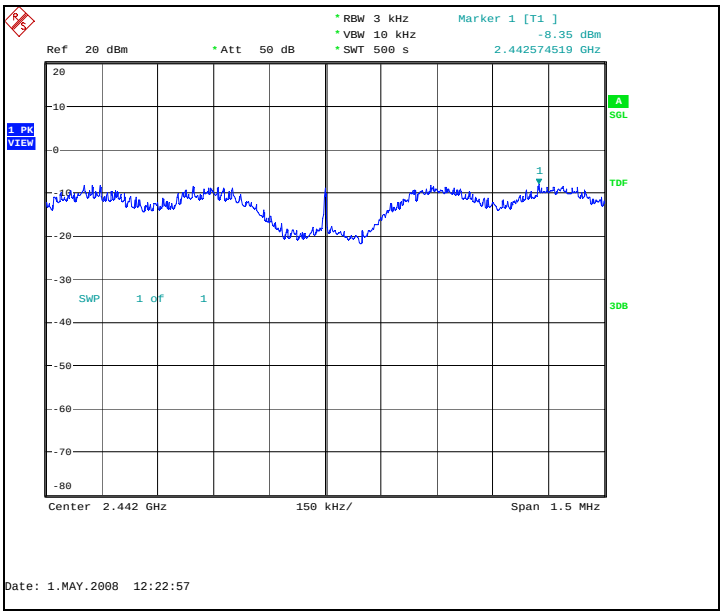
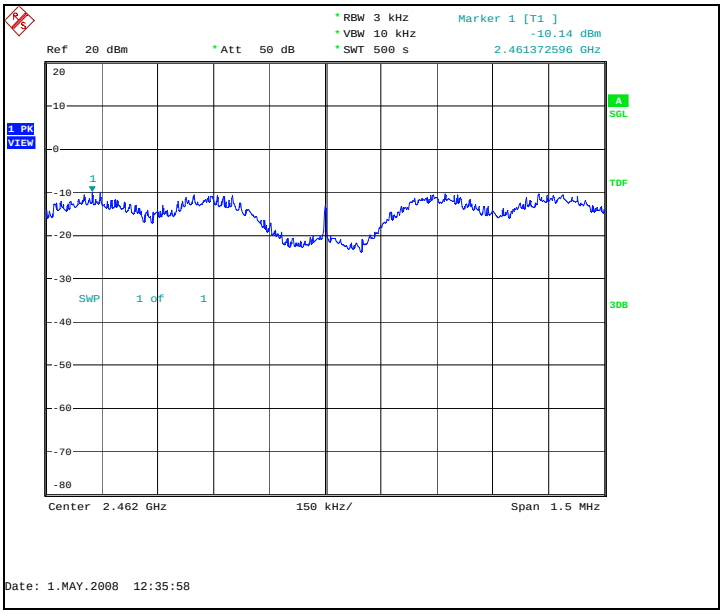
Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



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19. Field strength of the fundamental signal

(FCC §15.239(a), RSS-210 A2.8)

EUT with DUT number	RM-333 DUT 41471
Accessories with DUT numbers	BL-5K DUT 41477, AC-10E DUT 41478
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 48 / 101.9
Date of measurements	09-May-2008
Measured by	Jari Jantunen

19.1. Test method and limit

The measurement is made according to ANSI C63.4 and IC standard RSS-210.

Limits for field strength of the fundamental signal measurements (3 m measurement distance)

Limit [µV/m]	Limit [dBµV/m]	Detector
250	48	Average
2500	68	Peak

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19.2. FM TX Test results

Peak (RBW: 120 kHz, VBW: 300 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
88.030000	50.80	346.74	81.10	-30.30	HORIZONTAL	PASSED
97.935000	55.60	602.56	85.20	-29.60	VERTICAL	PASSED
107.965000	54.30	518.80	83.20	-28.90	VERTICAL	PASSED

Average (RBW: 120 kHz, VBW: 300 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
88.030000	39.60	95.50	69.90	-30.30	HORIZONTAL	PASSED
97.935000	47.90	248.31	77.50	-29.60	VERTICAL	PASSED
107.965000	47.30	231.74	76.20	-28.90	VERTICAL	PASSED

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20. Spurious radiated emissions

(FCC §15.239(c), RSS-210 A2.8)

EUT with DUT number	RM-333 DUT 41471
Accessories with DUT numbers	BL-5K DUT 41477, AC-10E DUT 41478, AD-54 DUT 41475, HS-45 DUT 41473
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 48 / 101.9
Date of measurements	09-May-2008
Measured by	Jari Jantunen

20.1. Test method and limit

The measurement is made according to ANSI C63.4 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
1000 – 1100	500	54	Average
1000 – 1100	5000	74	Peak

Spurious radiated emissions shall not exceed the field strength of the fundamental signal at any frequencies.

20.2. FM TX Test results

Low QP

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
30.050000	24.20	16.22	43.80	-19.60	VERTICAL	PASSED
37.039479	29.80	30.90	52.60	-22.80	VERTICAL	PASSED
66.701443	18.10	8.04	51.20	-33.10	VERTICAL	PASSED
72.141122	23.50	14.96	56.00	-32.50	VERTICAL	PASSED
85.892144	17.70	7.67	48.10	-30.40	VERTICAL	PASSED

Low AV

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
30.050000	10.90	3.51	30.50	-19.60	VERTICAL	PASSED
37.039479	7.60	2.40	30.40	-22.80	VERTICAL	PASSED
66.701443	10.50	3.35	43.60	-33.10	VERTICAL	PASSED
71.941122	-1.70	0.82	30.80	-32.50	VERTICAL	PASSED
85.942144	0.70	1.08	31.10	-30.40	VERTICAL	PASSED

Mid QP

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
30.600000	18.60	8.51	38.50	-19.90	VERTICAL	PASSED
37.189479	28.30	26.00	51.20	-22.90	VERTICAL	PASSED
66.651443	15.90	6.24	49.00	-33.10	VERTICAL	PASSED
71.191122	14.30	5.19	46.90	-32.60	VERTICAL	PASSED
85.542144	13.70	4.84	44.20	-30.50	VERTICAL	PASSED

Mid AV

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
30.200000	10.90	3.51	30.60	-19.70	VERTICAL	PASSED
37.039479	7.70	2.43	30.50	-22.80	VERTICAL	PASSED
66.651443	12.20	4.07	45.30	-33.10	VERTICAL	PASSED
71.191122	-1.60	0.83	31.00	-32.60	VERTICAL	PASSED
85.292144	0.40	1.05	30.90	-30.50	VERTICAL	PASSED

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High QP

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
30.050000	18.60	8.51	38.20	-19.60	VERTICAL	PASSED
37.039479	26.90	22.13	49.70	-22.80	VERTICAL	PASSED
67.451443	8.60	2.69	41.60	-33.00	VERTICAL	PASSED
72.091122	13.70	4.84	46.20	-32.50	VERTICAL	PASSED
86.192144	10.90	3.51	41.30	-30.40	VERTICAL	PASSED

High AV

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
30.000000	10.80	3.47	30.40	-19.60	VERTICAL	PASSED
37.089479	11.20	3.63	34.00	-22.80	VERTICAL	PASSED
66.651443	11.90	3.94	45.00	-33.10	VERTICAL	PASSED
71.291122	1.10	1.14	33.70	-32.60	VERTICAL	PASSED
85.292144	1.60	1.20	32.10	-30.50	VERTICAL	PASSED

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21. AC powerline conducted emissions

(FCC §15.207, RSS-210 6.6)

EUT with DUT number	RM-333 DUT 41471
Accessories with DUT numbers	BL-5K DUT 41477 / AC-10E DUT 41478 / AD-54 DUT 41475 / HS-45 DUT 41473
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	19 / 44 / 101.5
Date of measurements	07-May-2008
Measured by	Jari Jantunen

21.1. Test method and limit

The measurement is made according to ANSI C63.4 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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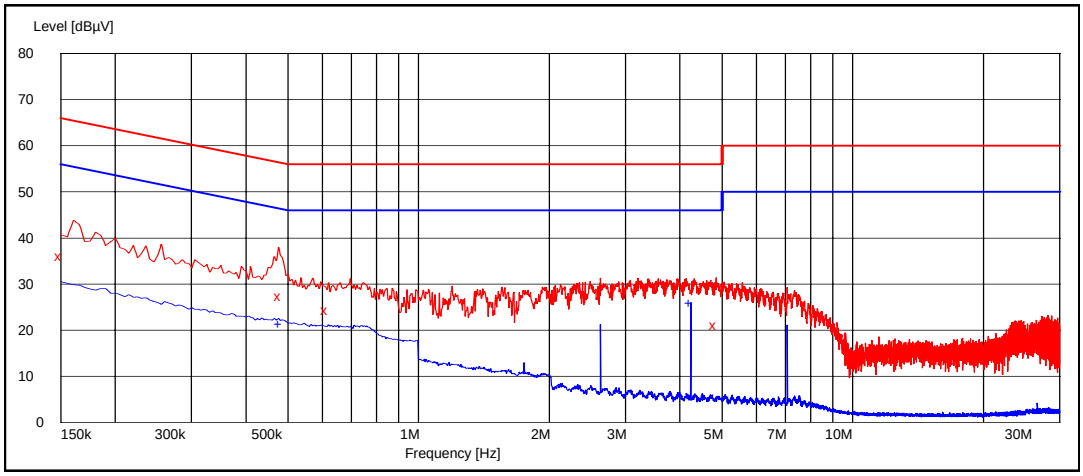
21.2. FM TX Test results

Middle channel / 98.0 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.150000	36.00	L1	PASSED
0.480000	27.50	N	PASSED
0.615000	24.40	N	PASSED
4.840000	21.20	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.480000	21.40	L1	PASSED
4.240000	25.90	N	PASSED

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22. 26 dB bandwidth

(FCC §15.239(a), RSS-210 A2.8)

EUT with DUT number	RM-333 DUT 41471
Accessories with DUT numbers	BL-5K DUT 41477
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 48 / 100.6
Date of measurements	26-Jun-2008
Measured by	Jari Jantunen

22.1. Test method and limit

The measurement is made according to ANSI C63.4 and IC standard RSS-210.

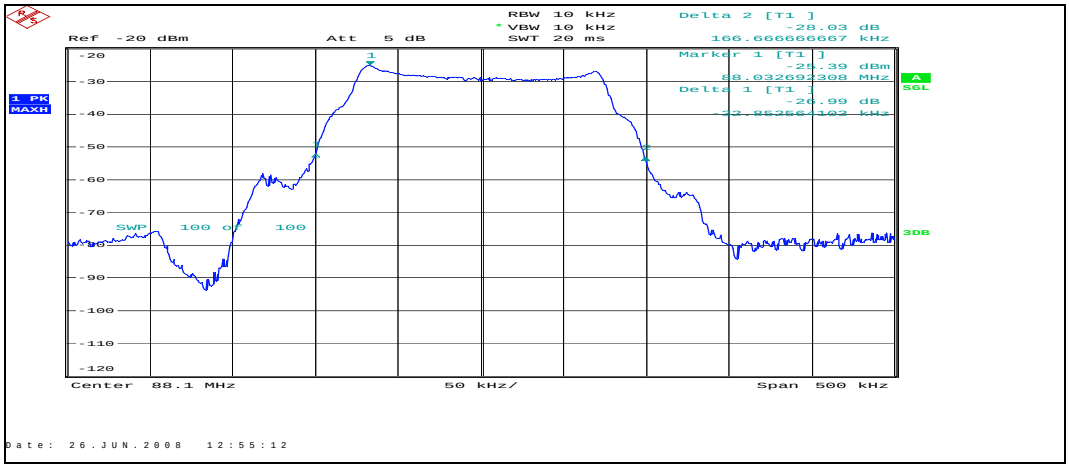
Limits for 26 dB bandwidth measurements

Limit [kHz]
≤ 200

22.2. FM TX Test results

Channel / f_C [MHz]	26 dB bandwidth [kHz]	Result
Low / 88.1	199.5	PASSED
Middle / 98.0	197.1	PASSED
High / 107.9	190.7	PASSED

Low channel / 88.1 MHz



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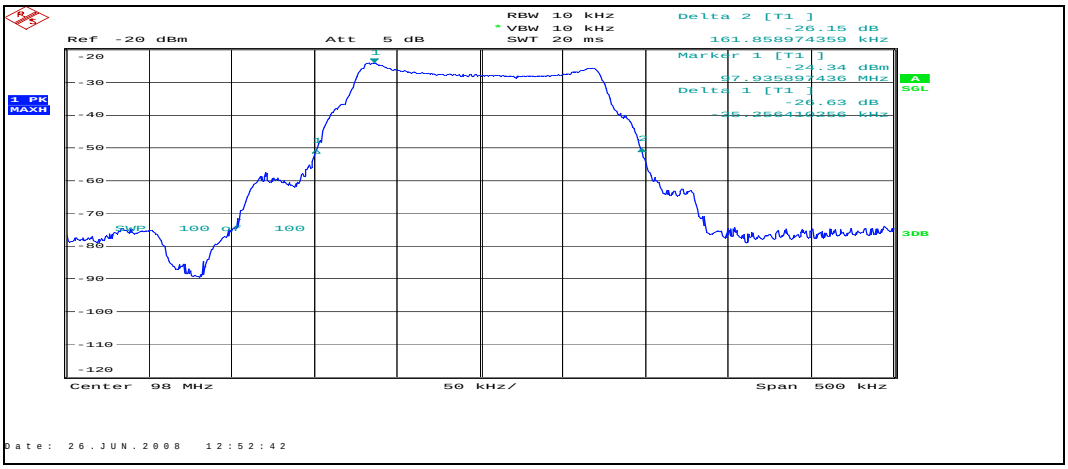
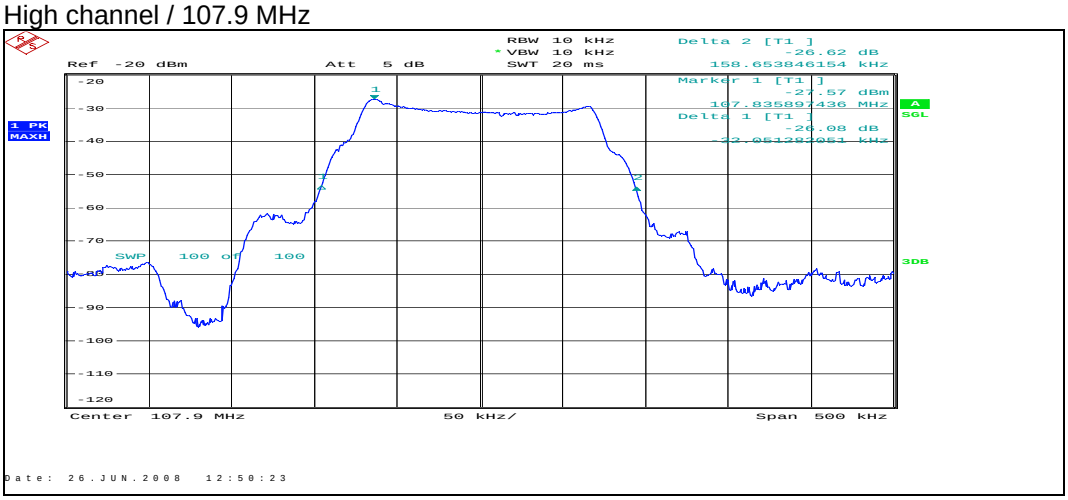
Middle channel / 98.0 MHz



High channel / 107.9 MHz



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23. Test Equipment

23.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30597	Power splitter	11667A	Agilent	22/24/27, 15C
TM37499	Power splitter	11667A	Agilent	22/24/27, 15C
TM38111	Multimeter	34401A	Agilent	22/24/27, 15C
TM38112	DC power supply	6632A	Agilent	22/24/27, 15C
TM22901	Attenuator	8496A	Agilent	22/24/27, 15C
TM30636	Artificial mains net	L2-16	PMM	15C, 15B
TM37678	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM37773	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM30600	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
TM26490	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM37610	Spectrum analyzer	FSU	R&S	22/24/27, 15C
TM22835	Multimeter	87	Fluke	15C, 15B
TM37500	Microwave switch system	7116-MSW	Keithley	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	Transformatic	22/24/27, 15C, 15B
	Temperature chamber	VT4002	Vötsch	22/24/27, 15C
2058	EMI Test receiver	ESPC	R&S	15C, 15B
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B
2002	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B

23.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30599	3m semi-anechoic chamber		TDK	22/24/27, 15C, 15B
TM38845	EMI receiver	ESI 40	R&S	22/24/27, 15C, 15B
TM37498	Preamplifier	AMF-5D-020180-26-10P	MITEQ	22/24/27, 15C, 15B
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	MITEQ	22/24/27, 15C, 15B
TM37516	Biconilog antenna	HL562	R&S	22/24/27, 15C, 15B
TM26496	Double ridged waveguide antenna	3115	EMCO	22/24/27, 15C, 15B
TM39158	Horn antenna	3116	EMCO	22/24/27, 15C, 15B
TM26492	Reference dipole set	UHAP/VHAP	Schwarzbeck	22/24/27, 15C, 15B
TM37501	Dipole antenna	3125-870	EMCO	22/24/27
TM37502	Dipole antenna	3125-1880	EMCO	22/24/27
TM37773	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM38631	Signal generator	83640L	Agilent	22/24/27, 15C, 15B
TM38066	High pass filter	4HC3000/18000-3-KK	Trilithic	22/24/27, 15C, 15B
TM26511	Tunable notch filter	WRCA870	Wainwright	22/24/27
TM38215	Tunable notch filter	WRCD1850/1910-0.2/40	Wainwright	22/24/27
TM38214	Band reject filter	WRCT 2402/2480-2400/2483.5-30	Wainwright	15C
TM30642	Mast/Turntable controller	HD-100	Deisel	22/24/27, 15C, 15B
TM26500	Turntable	DS412	Deisel	22/24/27, 15C, 15B
TM38842	Antenna mast controller	2090	EMCO	22/24/27, 15C, 15B
TM38843	Antenna mast	2075	EMCO	22/24/27, 15C, 15B
TM38114	DC power supply	6632A	Agilent	22/24/27, 15C, 15B
TM38323	Preamplifier	PA-02 18-26 GHz	EMC Automation	22/24/27, 15C, 15B
TM37678	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	Transformatic	22/24/27, 15C, 15B
TM23892	Yaesu controller	G-1000SDX	Yaesu	22/24/27, 15C, 15B
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B

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Eq. No	Equipment	Type	Manufacturer	Used in
2002	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B

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