FCC Part 15C Compliance Test Report

Test Report no.:	FCC15C_RM-356_11.doc	**Date of Report:**	22-Sep-2009
Number of pages:	34	**Customer's Contact person:**	Niina Upola
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 50 Elektroniikkatie 10 FIN-90571 OULU, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 47222
FCC listing no.: **IC recognition no.:**	533467 661V-1		
Tested devices/ accessories:	**Phone RM-356, Battery BL-5J, Headset HS-45, Audio Adapter AD-54, AC-Charger AC-8E**		
FCC ID:	LJPRM-356X	**IC:**	661E-RM356
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: 2009.09.22 09:17:44 +03'00'		

Jari Jantunen, Test System Manager

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	17-Jun-2009
Testing completed	
The customer's contact person	Niina Upola
Test Plan referred to	T:\Projects\RM-356\TestPlan_RS\RS_Testplan_RM-356_CR_HW1105.xls
Notes	-
Document name	T:\Projects\RM-356\EMC\FCC15C_RM-356_01.doc

1.1. EUT and Accessory Information

The EUT is a 6-band (GSM850/900/1800/1900 and WCDMA Band I/VIII) mobile phone with GPRS, EGPRS, Bluetooth and WLAN. Bluetooth and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-356	354216038115840	1105	-	21.0.025	13937
Phone	RM-356	354216038115923	1105	-	21.0.025	13938
Battery	BL-5J	4620409176J10100041;0670573	-	-	-	13942
Battery	BL-5J	4620409176J10100039;0670573	-	-	-	13941
Audio Adapter	AD-54	0750838803452104277	-	-	-	13945
Headset	HS-45	06942357231M1901222	-	-	-	13947
AC-Charger	AC-8E	1103338477200316260;0675387	-	-	-	13944

1.2. Summary of Test Results

WLAN:

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

PASSED 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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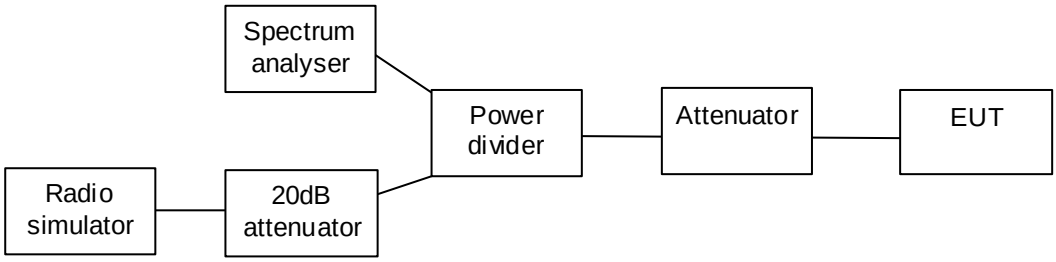
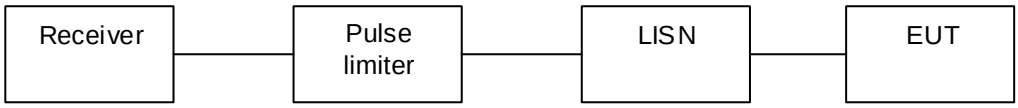
2. Test setups

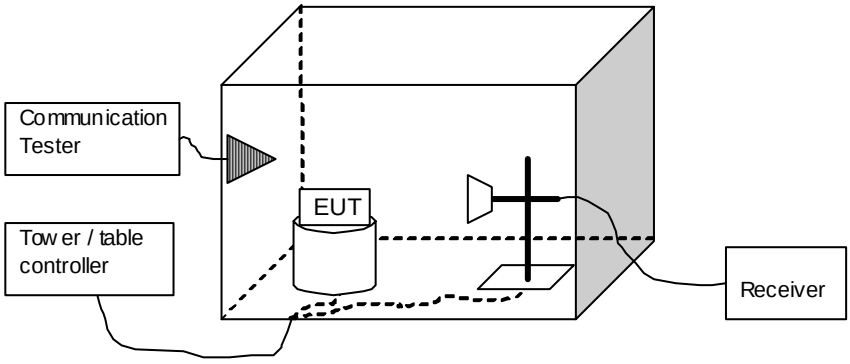
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Radiated test setup



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3. Conducted peak output power

(FCC §15.247(b)(1), RSS-210 A8.4 (4))

EUT with DUT number	RM-356, DUT 13937
Accessories with DUT numbers	BL-5J, DUT 13942; AD-54, DUT 13945, HS-45, DUT 13947; AC-8E, DUT 13944
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22,2 / 44 / 102
Date of measurements	29-Jun-2009
Measured by	Sami Lehtonen / Jouko Kaivonen

3.1. Test method and limit

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

Limits for conducted peak output power measurements

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

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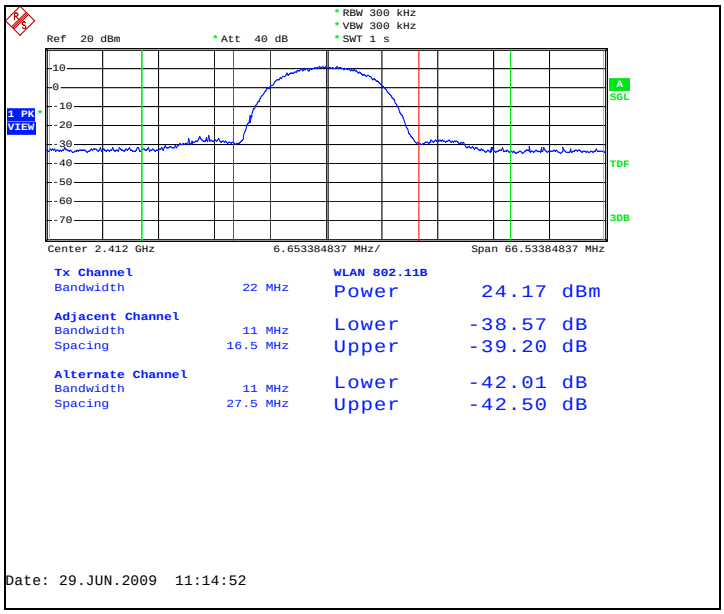
3.2. WLAN Test results

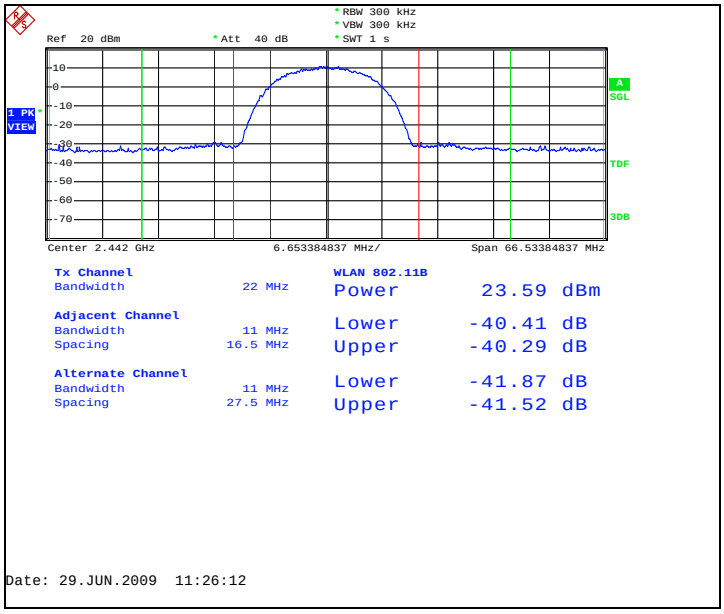
3.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_C [MHz]	P [dBm]	P [W]	Result
1 / 2412	24.17	0.261	PASSED
7 / 2442	23.59	0.229	PASSED
11 / 2462	23.29	0.213	PASSED

Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



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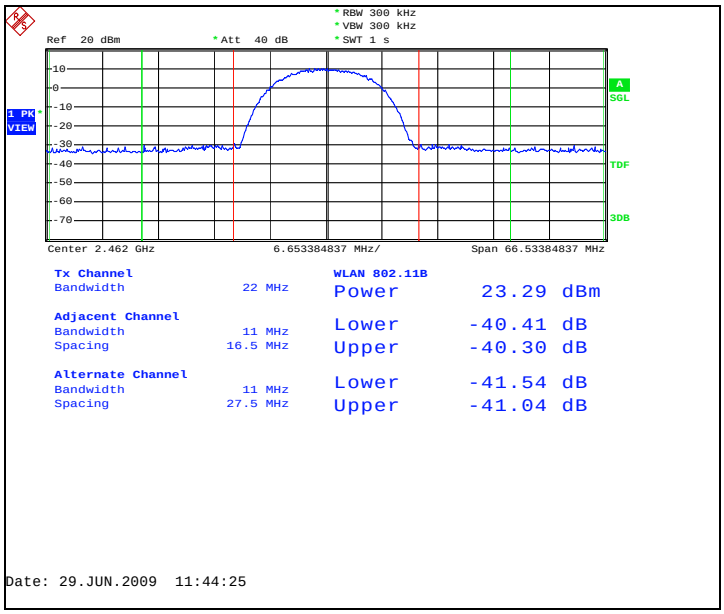
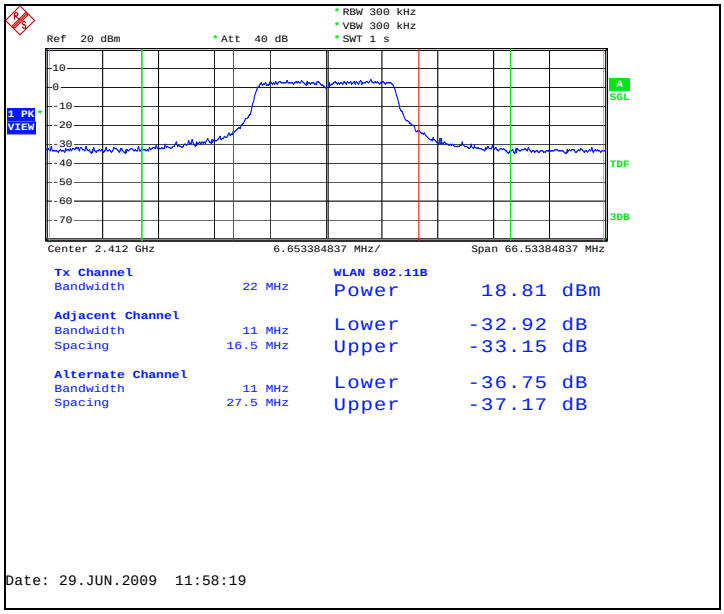
Channel 11 / 2462 MHz



3.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f_C [MHz]	P [dBm]	P [W]	Result
1 / 2412	18.81	0.076	PASSED
7 / 2442	22.42	0.175	PASSED
11 / 2462	18.11	0.065	PASSED

Channel 1 / 2412 MHz



Channel 7 / 2442 MHz

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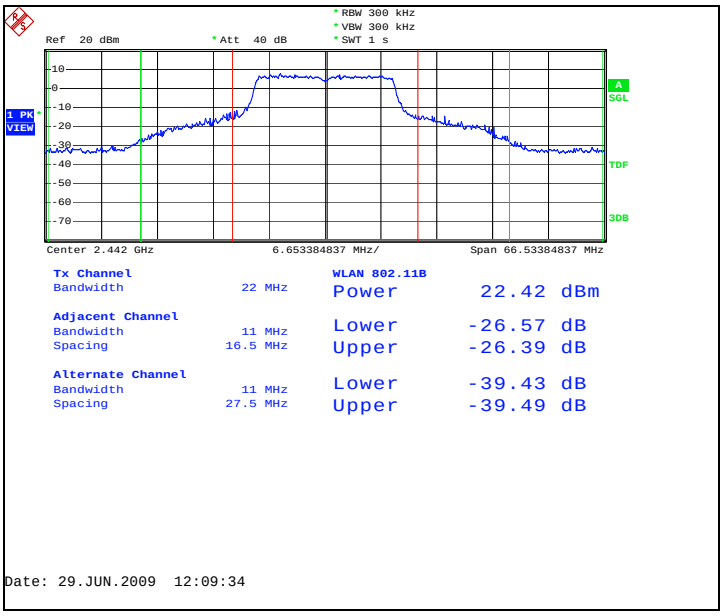
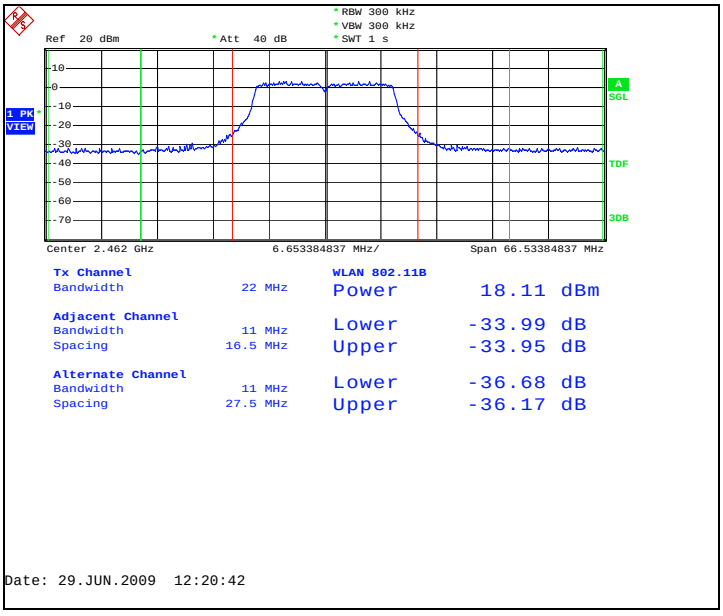


Channel 11 / 2462 MHz



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4. Band edge compliance of RF emissions

(FCC §15.247(d), RSS-210 A8.5)

EUT with DUT number	RM-356, DUT 13938
Accessories with DUT numbers	BL-5J, DUT 13941; HS-45, DUT 13947; AD-54, DUT 13945; AC-8E, DUT 13944
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 42 / 102.1
Date of measurements	25-Jun-2009
Measured by	Kalle Hannila

4.1. Test method and limit

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

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

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

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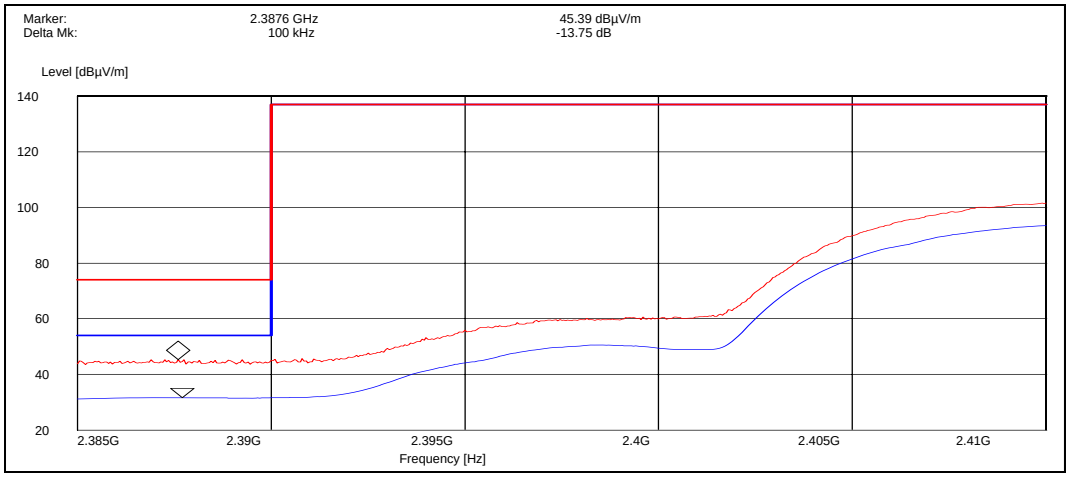
4.2. WLAN Test results

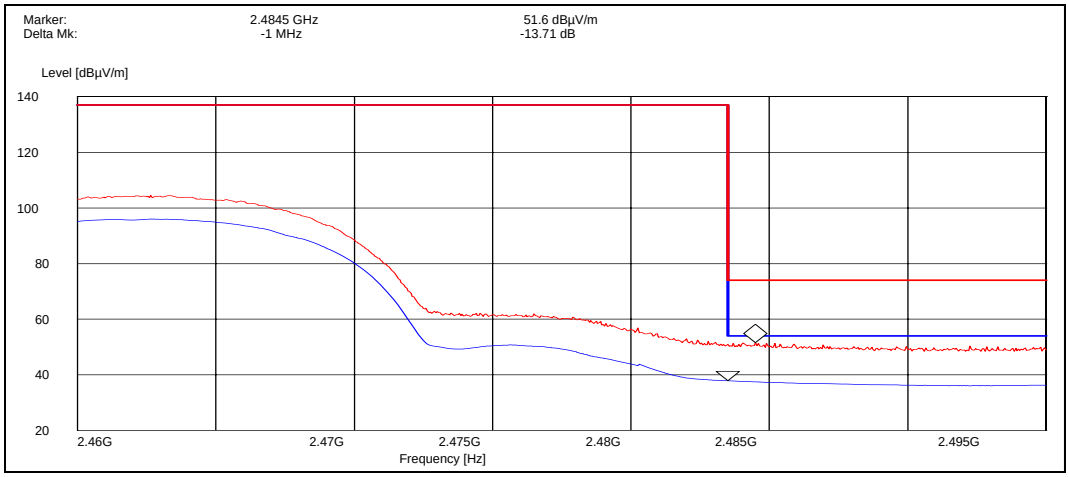
4.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 1 / 2412 MHz



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	45.40	PASSED
Average	31.60	PASSED

Channel 11 / 2462 MHz



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	51.60	PASSED
Average	37.90	PASSED

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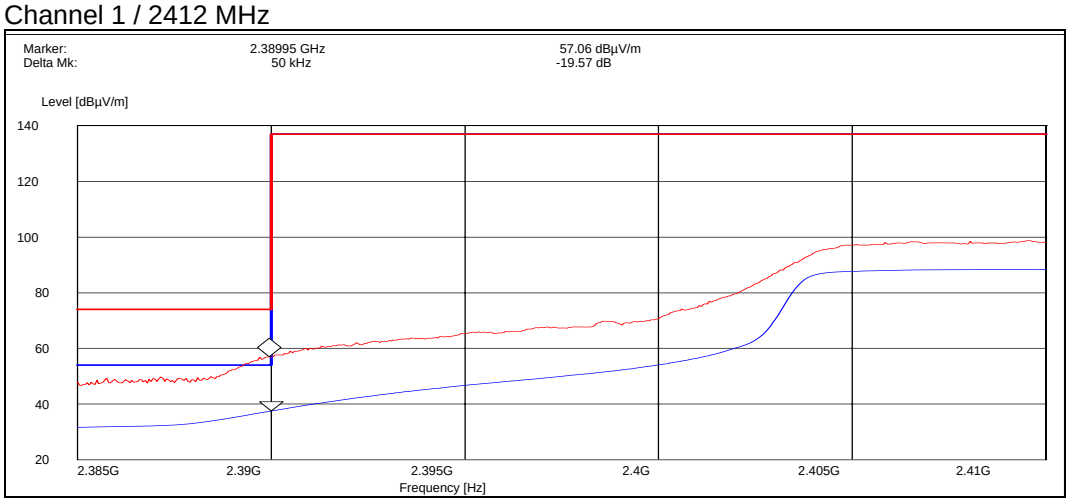
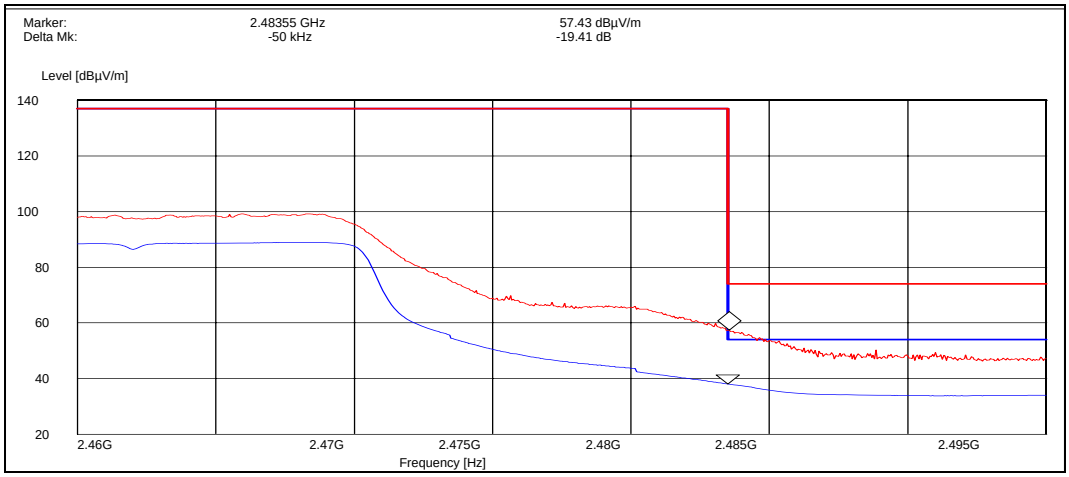
4.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 1 / 2412 MHz



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	57.10	PASSED
Average	37.50	PASSED

Channel 11 / 2462 MHz



Detector (RBW: 1 MHz)	E [dBµV/m]	Result
Peak	57.40	PASSED
Average	38.00	PASSED

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5. Spurious RF conducted emissions

(FCC §15.247(d), RSS-210 A8.5)

EUT with DUT number	RM-356, DUT 13937
Accessories with DUT numbers	BL-5J, DUT 13942; AD-54, DUT 13945, HS-45, DUT 13947; AC-8E, DUT 13944
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22,2 / 44 / 102
Date of measurements	29-Jun-2009
Measured by	Sami Lehtonen / Jouko Kaivonen

5.1. Test method and limit

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

Limits for spurious RF conducted emissions measurements

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

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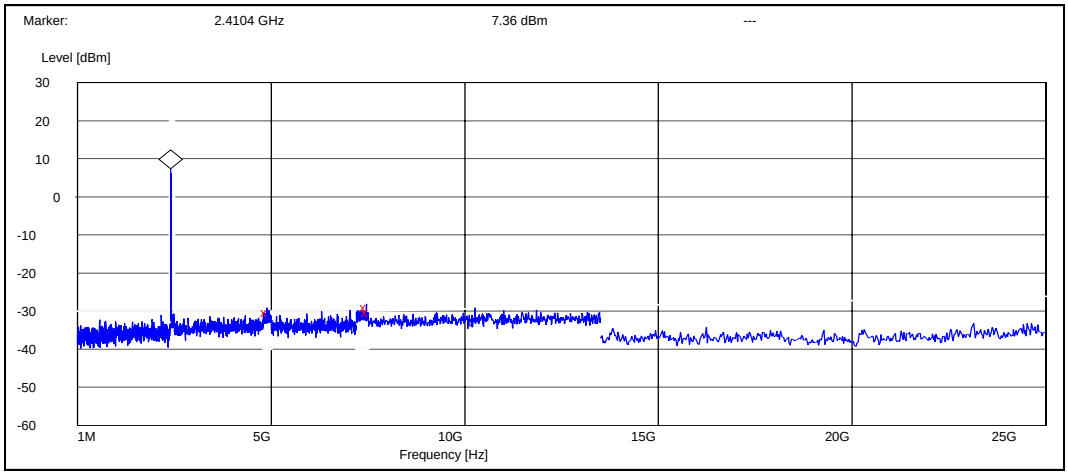
5.2. WLAN Test results

5.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

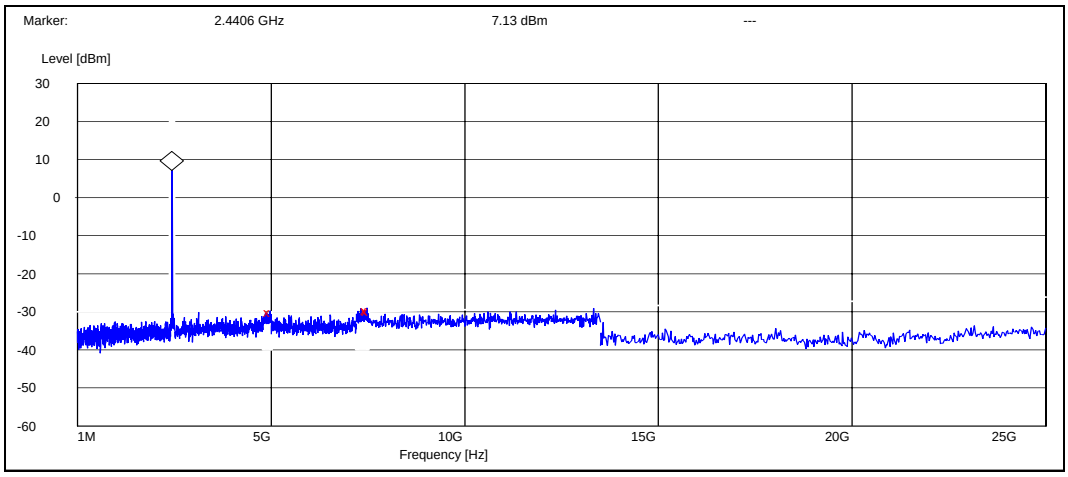
Channel 1 / 2412 MHz



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

Frequency [MHz]	P [dBc]	Result
4890.000000	-37.560722	PASSED
7462.200000	-36.460722	PASSED
7500.000000	-37.560722	PASSED

Channel 7 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4978.800000	-37.327014	PASSED
7476.600000	-36.727014	PASSED
7500.000000	-37.127014	PASSED

Channel 11 / 2462 MHz

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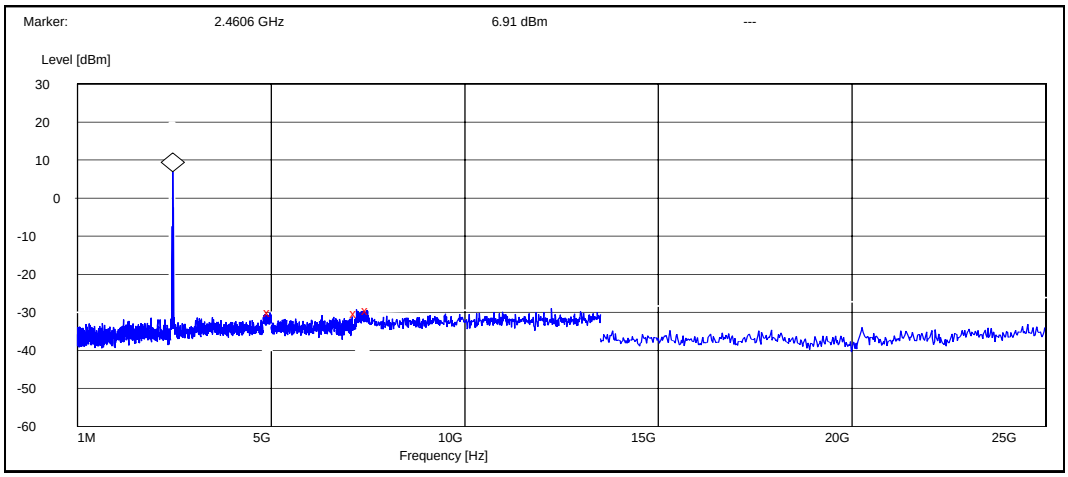

Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4980.800000	-36.910395	PASSED
7210.800000	-37.210395	PASSED
7500.000000	-36.410395	PASSED

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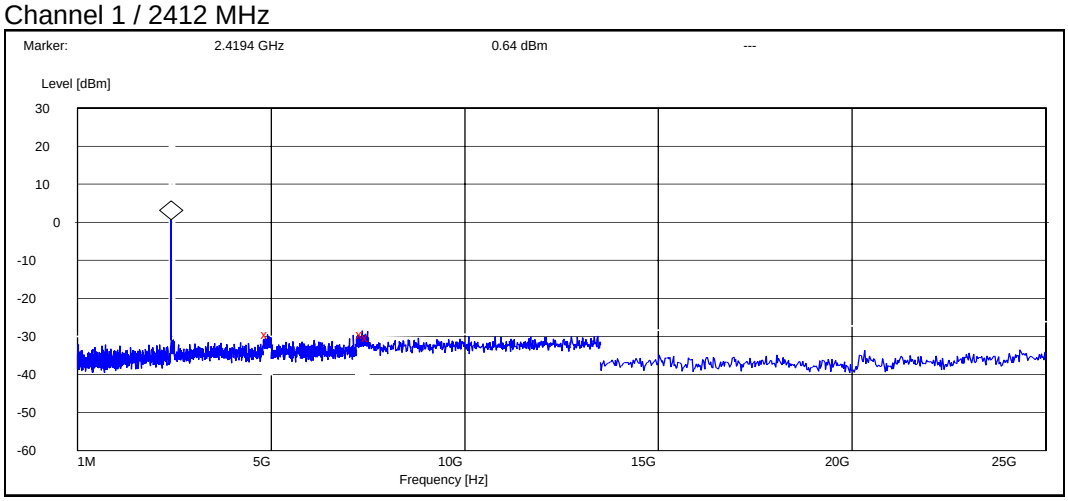
5.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

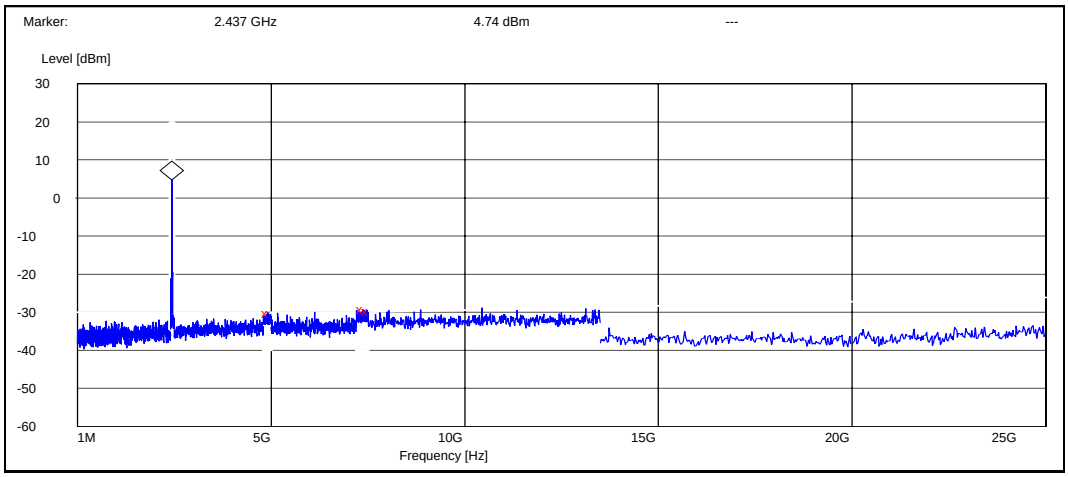
Channel 1 / 2412 MHz



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

Frequency [MHz]	P [dBc]	Result
4902.000000	-30.140305	PASSED
7360.800000	-30.140305	PASSED
7500.000000	-30.840305	PASSED

Channel 7 / 2442 MHz



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

Frequency [MHz]	P [dBc]	Result
4921.600000	-34.938617	PASSED
7373.400000	-34.038617	PASSED
7500.000000	-34.438617	PASSED

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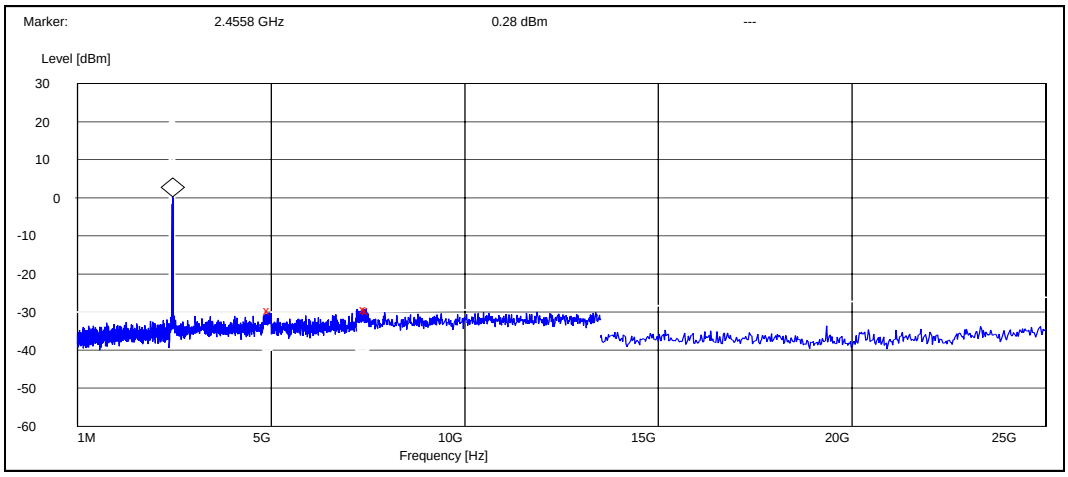
Channel 11 / 2462 MHz



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

Frequency [MHz]	P [dBc]	Result
4958.800000	-29.977258	PASSED
7452.000000	-29.477258	PASSED
7500.000000	-29.977258	PASSED

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6. Spurious radiated emissions

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

EUT with DUT number	RM-356, DUT 13938
Accessories with DUT numbers	BL-5J, DUT 13941; HS-45, DUT 13947; AD-54, DUT 13945; AC-8E, DUT 13944
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 42 / 102.1
Date of measurements	25-Jun-2009
Measured by	Kalle Hannila

6.1. Test method and limit

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

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed in the Semi-Anechoic Chamber with conducting metal floor, if the Preliminary Measurement results are closer than 20 dB to the permissible value.

The EUT is placed at nonconductive plate at the turntable center.

For each suspected frequency, the turntable is rotated 360 degrees and antenna is scanned from 1 to 4 m. This is repeated for both horizontal and vertical receive antenna polarizations.

The emissions less than 20 dB below the permissible value are reported.

The measurement results are obtained as described below:

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

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

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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. WLAN Test results

6.2.1 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	50.40	331.13	49.10	1.3	HORIZONTAL	PASSED
7236.000000	50.90	350.75	47.90	3.0	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
4824.000000	36.70	68.39	35.40	1.3	HORIZONTAL	PASSED
7236.000000	37.90	78.52	34.90	3.0	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	20.40	10.47	39.30	-18.9	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
4884.269539	47.90	248.31	46.60	1.3	HORIZONTAL	PASSED
7329.155311	49.20	288.40	45.80	3.4	VERTICAL	PASSED
12102.704409	53.00	446.68	40.80	12.2	HORIZONTAL	PASSED
13290.081162	53.00	446.68	40.30	12.7	VERTICAL	PASSED
15371.741483	56.70	683.91	38.50	18.2	HORIZONTAL	PASSED
15826.151303	56.30	653.13	37.80	18.5	VERTICAL	PASSED
16053.602204	57.20	724.44	36.80	20.4	VERTICAL	PASSED
17961.917836	58.20	812.83	38.10	20.1	VERTICAL	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4883.769539	34.00	50.12	32.70	1.3	HORIZONTAL	PASSED
7328.655311	36.30	65.31	33.00	3.3	VERTICAL	PASSED
12104.204409	40.20	102.33	28.00	12.2	HORIZONTAL	PASSED
13288.081162	40.20	102.33	27.40	12.8	VERTICAL	PASSED

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15374.241483	43.50	149.62	25.10	18.4	HORIZONTAL	PASSED
15829.151303	42.80	138.04	24.40	18.4	VERTICAL	PASSED
16050.102204	44.70	171.79	24.00	20.7	VERTICAL	PASSED
17960.417836	44.70	171.79	24.60	20.1	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	43.70	153.11	43.00	0.7	VERTICAL	PASSED
7386.000000	48.80	275.42	44.60	4.2	VERTICAL	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4924.000000	31.70	38.46	31.00	0.7	HORIZONTAL	PASSED
7386.000000	36.80	69.18	32.60	4.2	HORIZONTAL	PASSED

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6.2.2 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	45.30	184.08	44.00	1.3	HORIZONTAL	PASSED
7236.000000	46.60	213.80	43.60	3.0	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
4824.000000	32.60	42.66	31.30	1.3	HORIZONTAL	PASSED
7236.000000	34.60	53.70	31.60	3.0	HORIZONTAL	PASSED

Channel 7 / 2442 MHz

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
37.695391	20.80	10.96	39.40	-18.6	VERTICAL	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
2493.512024	57.00	707.95	59.60	-2.6	HORIZONTAL	PASSED
4881.767535	45.80	194.98	44.50	1.3	HORIZONTAL	PASSED
7326.155311	54.20	512.86	50.90	3.3	VERTICAL	PASSED
12504.012024	53.20	457.09	41.50	11.7	VERTICAL	PASSED
14497.497996	53.20	457.09	38.20	15.0	VERTICAL	PASSED
15377.253507	56.20	645.65	37.90	18.3	HORIZONTAL	PASSED
15775.057114	55.80	616.60	38.30	17.5	HORIZONTAL	PASSED
16054.604208	57.50	749.89	37.20	20.3	VERTICAL	PASSED
17961.917836	57.80	776.25	37.70	20.1	VERTICAL	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
2492.012024	37.60	75.86	38.90	-1.3	HORIZONTAL	PASSED
4885.267535	33.20	45.71	31.90	1.3	HORIZONTAL	PASSED
7326.655311	38.20	81.28	34.90	3.3	VERTICAL	PASSED
12504.012024	40.00	100.00	28.30	11.7	VERTICAL	PASSED
14501.497996	40.80	109.65	25.80	15.0	VERTICAL	PASSED
15373.753507	43.50	149.62	25.10	18.4	HORIZONTAL	PASSED
15775.557114	42.80	138.04	25.30	17.5	HORIZONTAL	PASSED
16050.104208	44.80	173.78	24.10	20.7	VERTICAL	PASSED
17962.417836	44.70	171.79	24.50	20.2	VERTICAL	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	43.80	154.88	43.10	0.7	HORIZONTAL	PASSED
7386.000000	47.80	245.47	43.60	4.2	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	31.40	37.15	30.70	0.7	HORIZONTAL	PASSED
7386.000000	35.20	57.54	31.00	4.2	HORIZONTAL	PASSED

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

EUT with DUT number	RM-356, DUT 13938
Accessories with DUT numbers	BL-5J, DUT 13942; AD-54, DUT 13945, HS-45, DUT 13947; AC-8E, DUT 13944
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21,9 / 73 / 103,1
Date of measurements	30-Jun-2009
Measured by	Sami Lehtonen / Jouko Kaivonen

7.1. Test method and limit
The measurement is made according to DTS procedures KDB 558074 and IC standard RSS-GEN as follows:

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

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

The measurement results are obtained as described below:

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

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

CISPR 22 Class B limits

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

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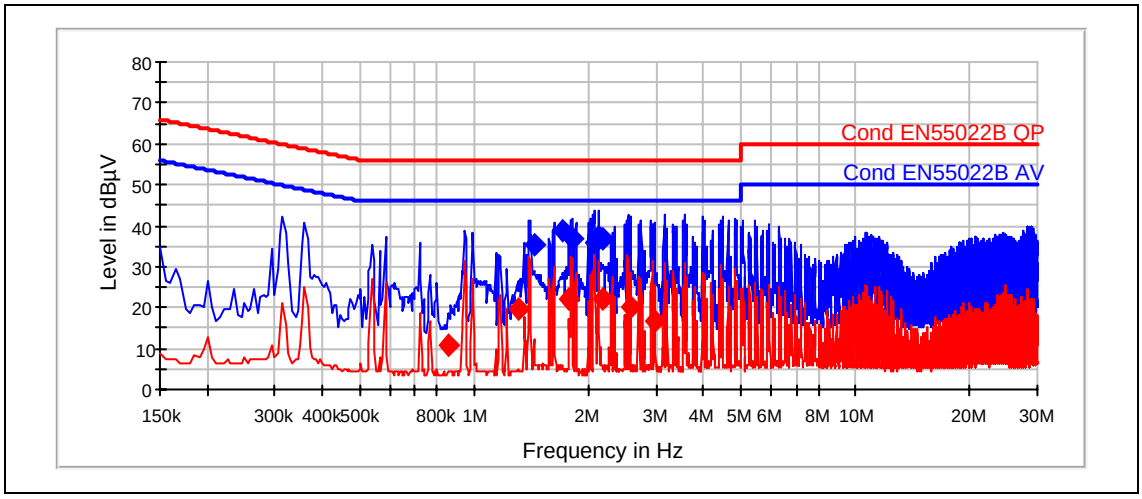
7.2. WLAN Test results

7.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 7 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	Quasi peak [dBµV]	Line	Margin [dB]	Result
1.445	35.15	L1	20.80	PASSED
1.715	38.60	L1	17.40	PASSED
1.805	36.77	L1	19.20	PASSED
2.075	36.06	N	19.90	PASSED
2.120	37.27	N	18.70	PASSED
2.165	36.87	L1	19.10	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	Average [dBµV]	Line	Margin [dB]	Result
0.855	10.90	N	35.10	PASSED
1.310	19.83	L1	26.20	PASSED
1.760	22.31	L1	23.70	PASSED
2.165	22.07	L1	23.90	PASSED
2.570	19.89	L1	26.10	PASSED
2.980	16.79	L1	29.20	PASSED

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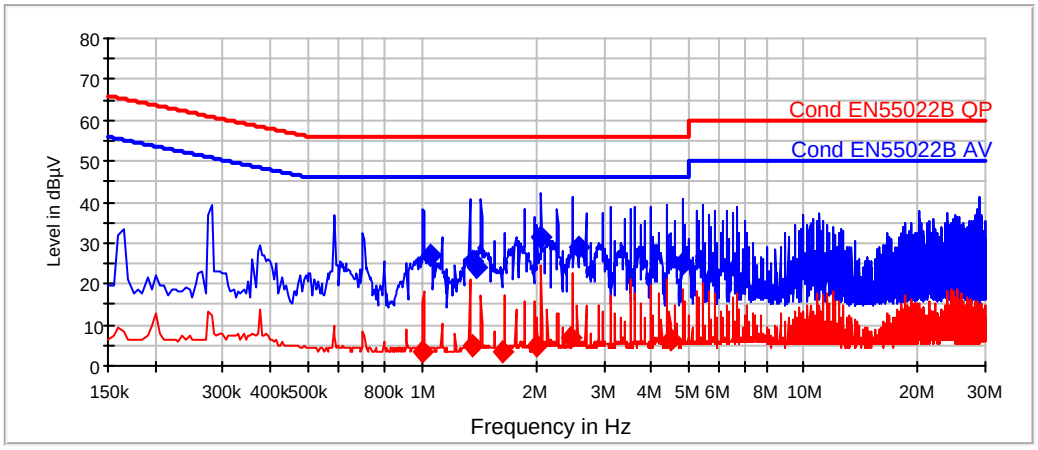
7.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 7 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	Quasi peak [dBµV]	Line	Margin [dB]	Result
1.050	26.90	L1	29.10	PASSED
1.355	25.32	L1	30.70	PASSED
1.385	24.00	N	32.00	PASSED
2.055	31.37	L1	24.60	PASSED
2.565	28.78	L1	27.20	PASSED
4.800	25.17	L1	30.80	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	Average [dBµV]	Line	Margin [dB]	Result
1.000	3.59	N	42.40	PASSED
1.360	4.67	L1	41.30	PASSED
1.625	3.52	N	42.50	PASSED
2.000	4.81	L1	41.20	PASSED
2.465	6.67	L1	39.30	PASSED
4.475	6.34	L1	39.70	PASSED

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8. 6 dB bandwidth

(FCC §15.247(a)(2), RSS-210 A8.2 (a))

EUT with DUT number	RM-356, DUT 13937
Accessories with DUT numbers	BL-5J, DUT 13942; AD-54, DUT 13945, HS-45, DUT 13947; AC-8E, DUT 13944
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22,2 / 44 / 102
Date of measurements	29-Jun-2009
Measured by	Sami Lehtonen / Jouko Kaivonen

8.1. Test method and limit

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

Limits for 6 dB bandwidth measurements

Limit [kHz]
≥ 500

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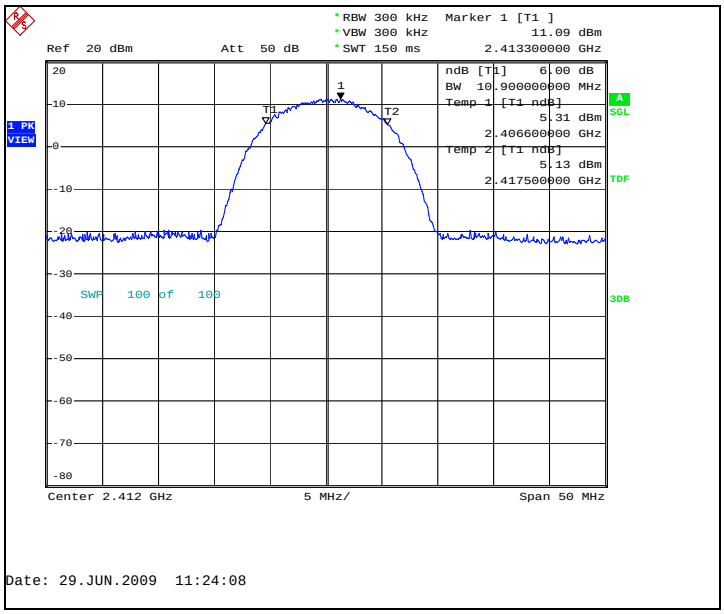
8.2. WLAN test results

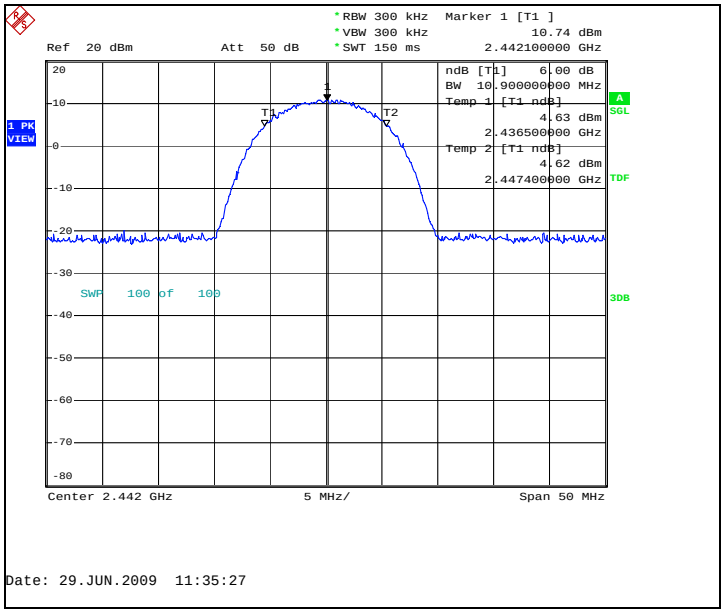
8.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_C [MHz]	6 dB bandwidth [kHz]	Result
1	10900.000	PASSED
7	10900.000	PASSED
11	10900.000	PASSED

Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



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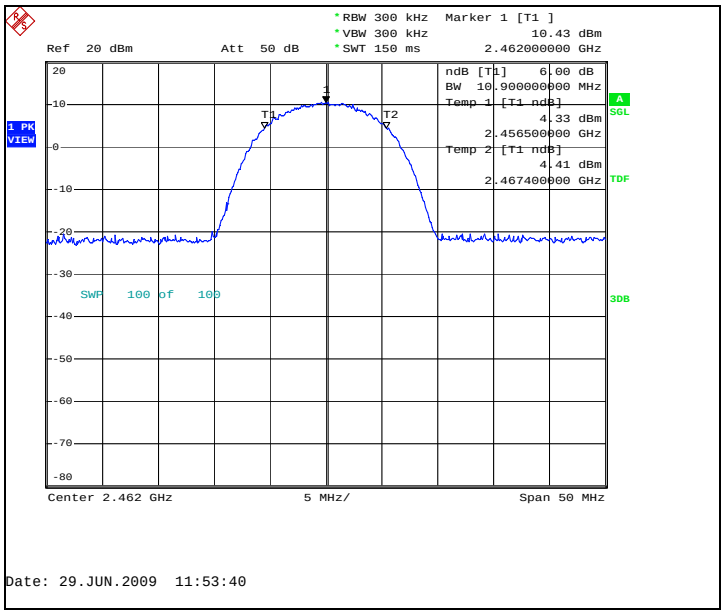
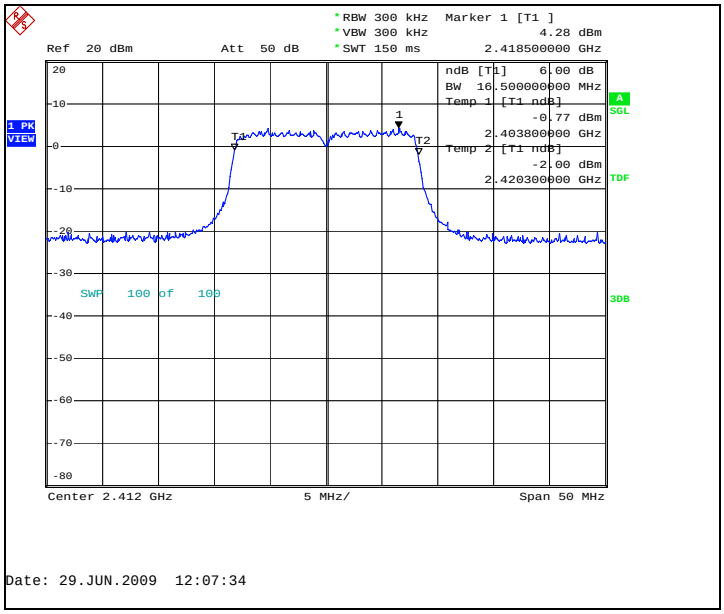
Channel 11 / 2462 MHz



8.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f_C [MHz]	6 dB bandwidth [kHz]	Result
1	16500.000	PASSED
7	16600.000	PASSED
11	16600.000	PASSED

Channel 1 / 2412 MHz



Channel 7 / 2442 MHz

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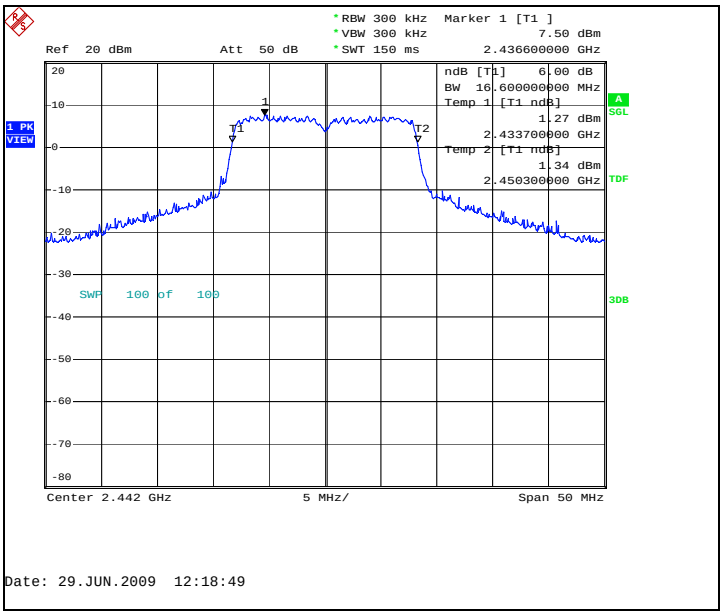
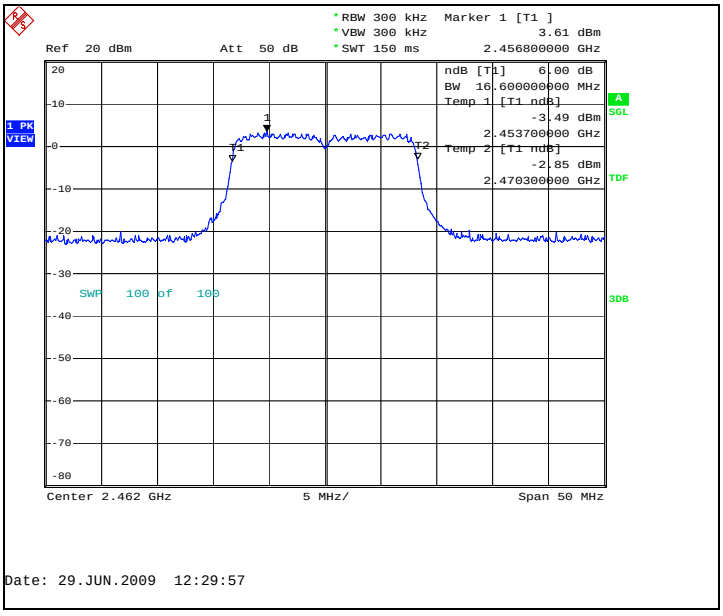


Channel 11 / 2462 MHz



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9. Power spectral density

(FCC §15.247(e), RSS-210 A8.2 (b))

EUT with DUT number	RM-356, DUT 13937
Accessories with DUT numbers	BL-5J, DUT 13942; AD-54, DUT 13945, HS-45, DUT 13947; AC-8E, DUT 13944
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22,2 / 44 / 102
Date of measurements	29-Jun-2009
Measured by	Sami Lehtonen / Jouko Kaivonen

9.1. Test method and limit

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

Limits for power spectral density measurements

Limit [dBm] @ 3 kHz
≤ 8

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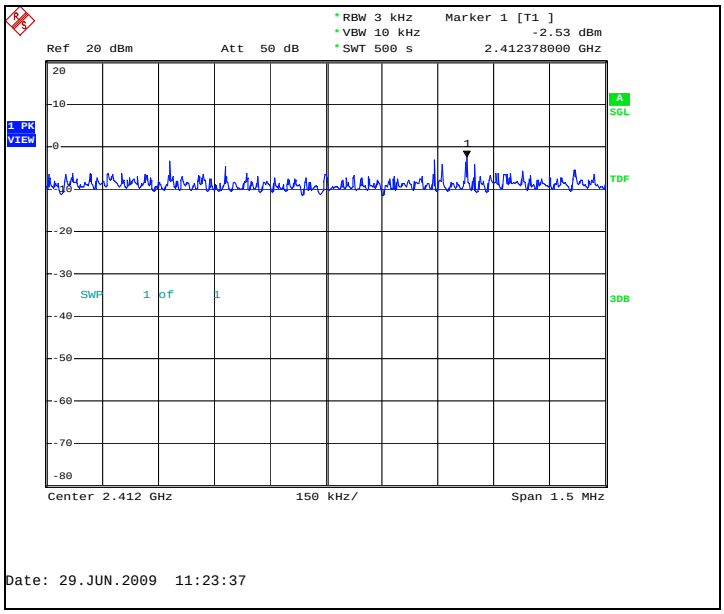
9.2. WLAN test results

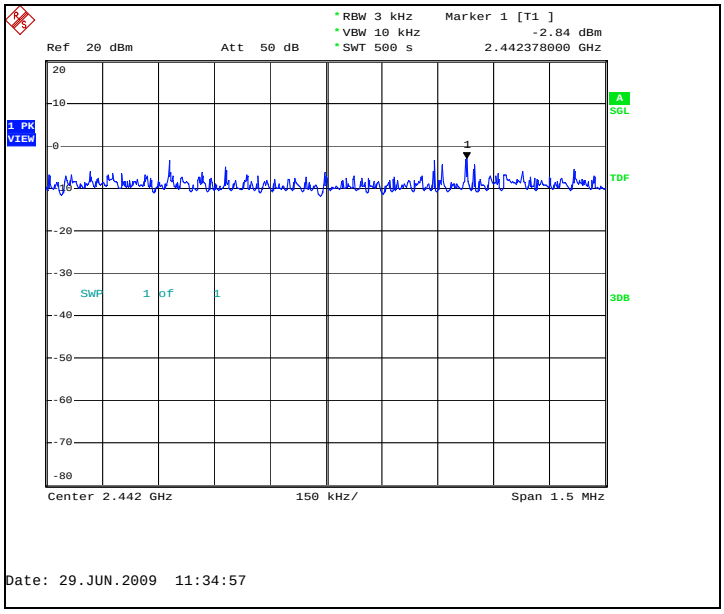
9.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel / f_C [MHz]	P [dBm]	Result
1 / 2412	-2.53	PASSED
7 / 2442	-2.84	PASSED
11 / 2462	-3.15	PASSED

Channel 1 / 2412 MHz



Channel 7 / 2442 MHz



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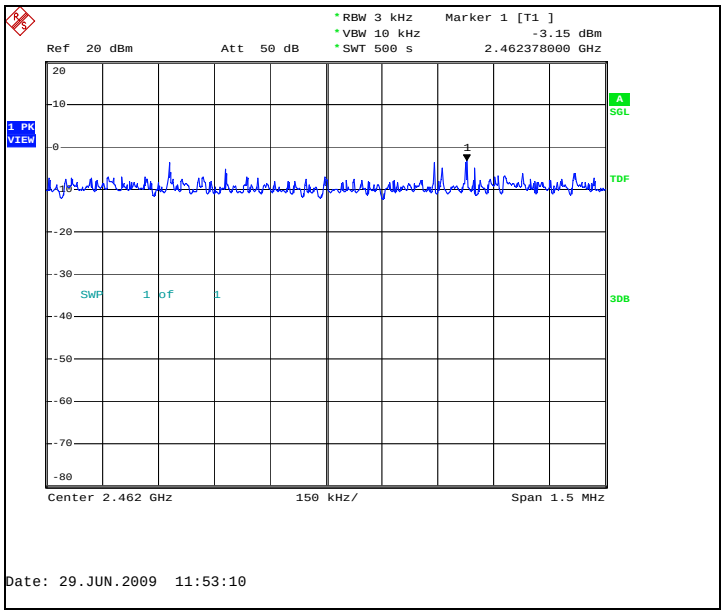
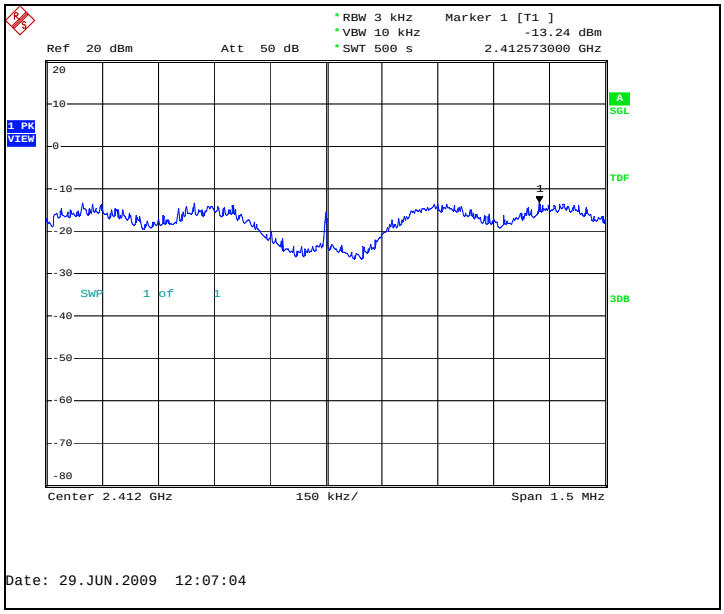
Channel 11 / 2462 MHz



9.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel / f_C [MHz]	P [dBm]	Result
1 / 2412	-13.24	PASSED
7 / 2442	-9.26	PASSED
11 / 2462	-13.86	PASSED

Channel 1 / 2412 MHz



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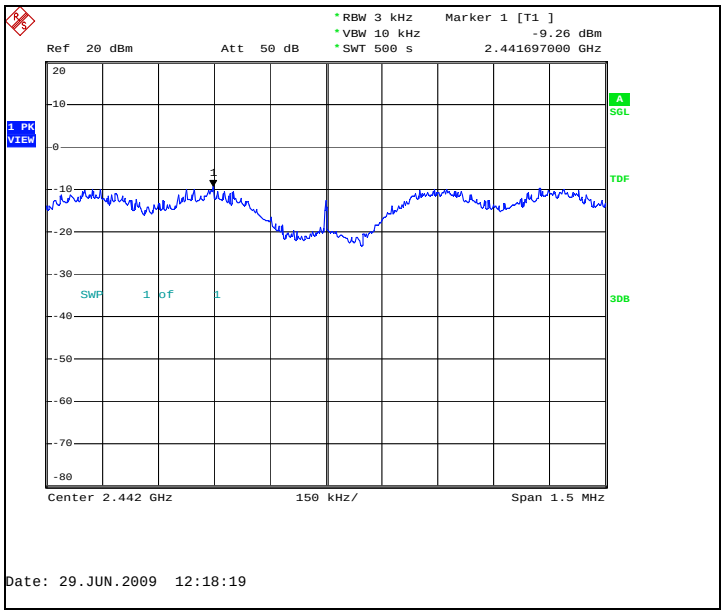
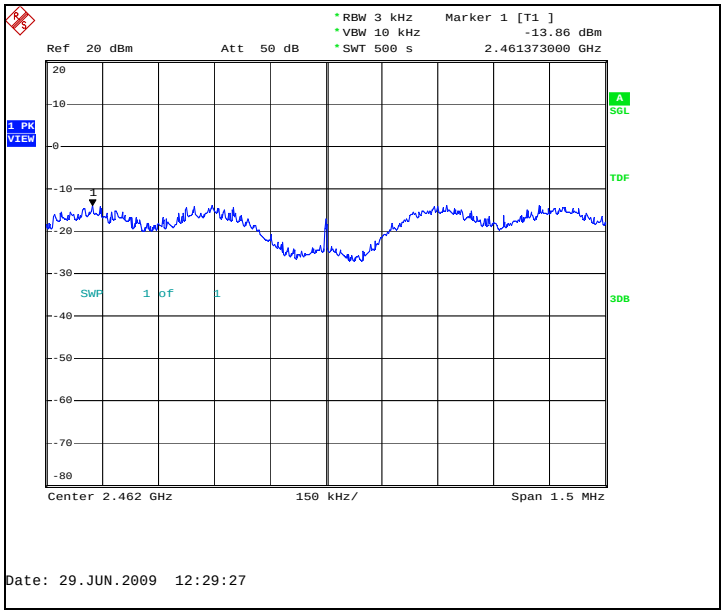
Channel 7 / 2442 MHz



Channel 11 / 2462 MHz



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10. Test Equipment

10.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1742	EMI Test Receiver	ESMI	R&S	15C, 15B
1759	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
1872	Thermo- Hygrograph	00.02520.150700	Lambrecht	15C, 15B
1916	Radio Communication tester	CMTA84	R&S	15C, 15B
2039	Power Supply	PL330QMD	THURLBY	15C, 15B
2060	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
2068	CDN-Antenna line	S1	NMP	15C, 15B
2097	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
2111	Multimeter	TX3	Tektronix	15C, 15B
2156	Digital Radio Communication Tester	CMU200	R&S	15C, 15B
2206	Signal generator	SMX	R&S	15C, 15B
2335	GPIB Switch 2 to 1	-	National Instruments	15C, 15B
2347	Digital Radio Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2352	Spectrum Analyzer	FSP	R&S	22/24/27, 15C
2359	Temperature Test system	VT4002	Vötsch Industrietechnik	22/24/27
2360	Serial Bus Converter	Serial 488A	IO Tech	22/24/27
2362	Power Supply	NGPX 70/5	R&S	22/24/27
2388	Bluetooth Tester	CBT	R&S	15C, 15B
-	RF Emission Software	ES-K1 v.1.71	R&S	22/24/27, 15C, 15B

10.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1748	Log. per. Antenna	HL025	R&S	22/24/27, 15C
1749	Log. per. Antenna	HL025	R&S	22/24/27, 15C
1875	Thermo- Hygrograph	00.02520.150700	Lambrecht	22/24/27, 15C, 15B
1917	Radio Communication tester	CMTA84	R&S	22/24/27, 15C, 15B
1933	Precision half-wave dipole antennas	HZ-13	R&S	22/24/27, 15C
1938	Precision half-wave dipole antennas	HZ-12	R&S	22/24/27, 15C
2006	Radiation Reference Source	VSQ	MEB	22/24/27, 15C, 15B
2009	Signal generator	SMP 22	R&S	22/24/27, 15C, 15B
2019	Multimeter	34401A	HP	22/24/27, 15C, 15B
2027	Coupling and Decoupling Network	M2 (modified) DC1	MEB	22/24/27, 15C, 15B
2028	Coupling and Decoupling Network	M3 (modified) DC2	MEB	22/24/27, 15C, 15B
2029	Power Supply	PL330	THURLBY	22/24/27, 15C, 15B
2043	Band Reject Filter	WRCA824/849-0,2-6SS	Wainwright	22, 15C, 15B
2047	Band Reject Filter	WRCC1800/2000-0.2-10SS	Wainwright	24, 15C, 15B
2048	Band Reject Filter	WRCC1700/1800-0.2-10SS	Wainwright	27, 15C, 15B
2051	High Pass Filter	4HC1700-1-KK	R&S	22/24/27, 15C
2057	Log. per. Antenna	HL025	R&S	22/24/27, 15C
2109	Power Supply	PL330QMD	THURLBY	22/24/27, 15C, 15B
2110	Multimeter	34401A	HP	22/24/27, 15C, 15B
2112	Multimeter	TX3	Tektronix	22/24/27, 15C, 15B
2116	Controller	EMCO MODEL 2090	ETS	22/24/27, 15C, 15B
2133	Power Meter	NRVS	R&S	22/24/27, 15C
2134	Power Sensor	NRV-Z32	R&S	22/24/27, 15C
2135	Coupling and Decoupling Network	CDN 801-M3	LÜTHI	22/24/27, 15C, 15B

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

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