TCC Nokia

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

FCC Part 15C Compliance Test Report

Test Report no.:	Cph_FCC_0652_03.doc	**Date of Report:**	11-01-2007
Number of pages:	28	**Customer's Contact person:**	Jarkko Luoma
Testing laboratory:	TCC Nokia Copenhagen Laboratory Frederikskaj 1790 COPENHAGEN V DENMARK Tel. +45 33 292929 Fax. +45 33 292934	**Customer:**	Nokia Corporation P.O. Box 86 Joensuunkatu 7 FIN-24101 SALO, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 44277
FCC listing no.: **IC recognition no.:**	99059 4820 and 4820-1		
Tested devices/ accessories:	**Phone; RA-6 (HW: 4100), Battery; BP-4L, AC-Charger; AC-4E, Headset; HS-47**		
FCC ID:	PYARA-6	**IC:**	661V-RA6
Supplement reports:	-		
Testing has been carried out in accordance with:	**CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2003), Public Notice DA 00-705, DTS procedures KDB 558074, IC standards RSS-GEN and RSS-210. Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".**		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test Results:	**The EUT complies with the requirements in respect of all parameters subject to the test.** The test results relate only to devices specified in this document.		
Date and signature for the contents:	 Test Engineer		Digitally signed by Allan Franch Henriksen DN: cn=Allan Franch Henriksen, c=DK, o=Nokia, ou=CertMT, email=allan.f.henriksen@nokia.com Date: 2007.01.11 10:15:52 +01'00'

Allan F. Henriksen, Engineer

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	18-12-2006
Testing completed	11-01-2007
The customer's contact person	Jarkko Luoma
Test Plan referred to	\EMC\TESTPLAN\
Notes	None
Document name	T:\Projects\RA-6\EMC\Results\FCC\Cph_FCC_0652_03.doc

1.1. EUT and Accessory Information

The EUT is a 5-band (GSM850/900/1800/1900 and WCDMA Band I) mobile phone with GPRS, EGPRS, Bluetooth and WLAN. Bluetooth and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RA-6	004400911738316	4100	-	06.46.00	29112
Battery	BP-4L	-	-	-	-	29113
AC-Charger	AC-4E	110333613208120726 0;0675384	1.1	-	-	29124
AC-Charger	AC-4E	110333613208120725 7;0675384	1.1	-	-	29121
Headset	HS-47	-	4.1	3.0	-	29122

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	NP
15.247(c)	A8.5	Band edge compliance of RF emissions	PASSED
15.247(c)	A8.5	Spurious RF conducted emissions	NP
15.247(c), 15.209	A8.5	Spurious radiated emissions	PASSED
15.207	*7.2.2*	AC powerline conducted emissions	PASSED
15.247(a)(1)	A8.1 (1)	20 dB bandwidth	NP
15.247(a)(1)	A8.1 (2)	Carrier frequency separation	NP
15.247(a)(1)(iii)	A8.1 (4)	Number of hopping frequencies	NP
15.247(a)(1)(iii)	A8.1 (4)	Time of occupancy	NP

WLAN:

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

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 Copenhagen Laboratory.

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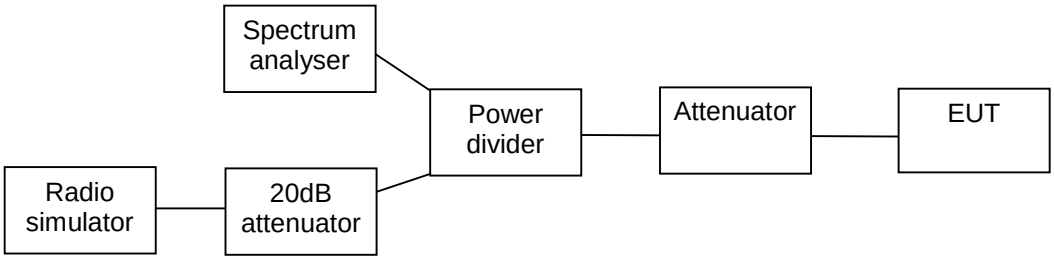
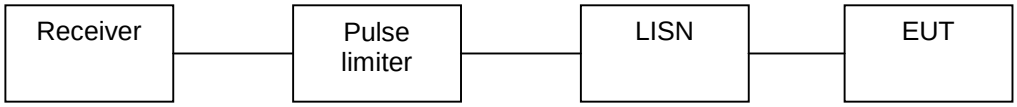
2. Test setups

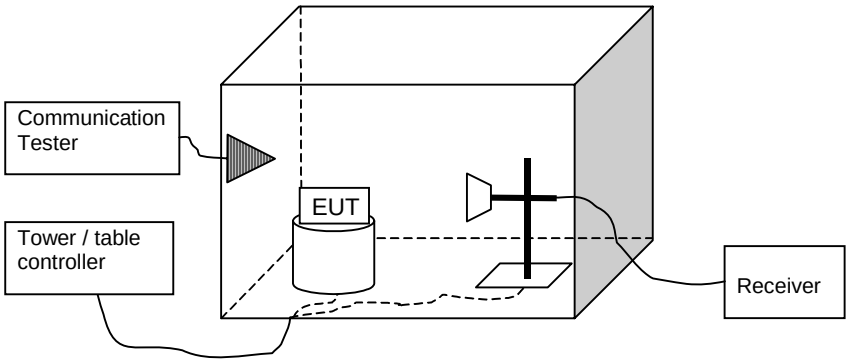
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Spurious radiated emissions test setup



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3. Band edge compliance of RF emissions

(FCC §15.247(c), RSS-210 A8.5)

EUT with DUT number	RA-6 Dut #29112
Accessories with DUT numbers	BP-4L Dut #29113 + AC-4E Dut #29124 + HS-47 Dut #29122
Operation Voltage [V] / [Hz]	230 / 50
Result	PASSED
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	21.7 / 40.5 / 1028.3
Date of measurements	29-12-2006
Measured by	Jia Dongsheng & Christian Andersen

3.1. 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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3.2. Bluetooth Test results

3.2.1 GFSK modulation, PRBS packet type

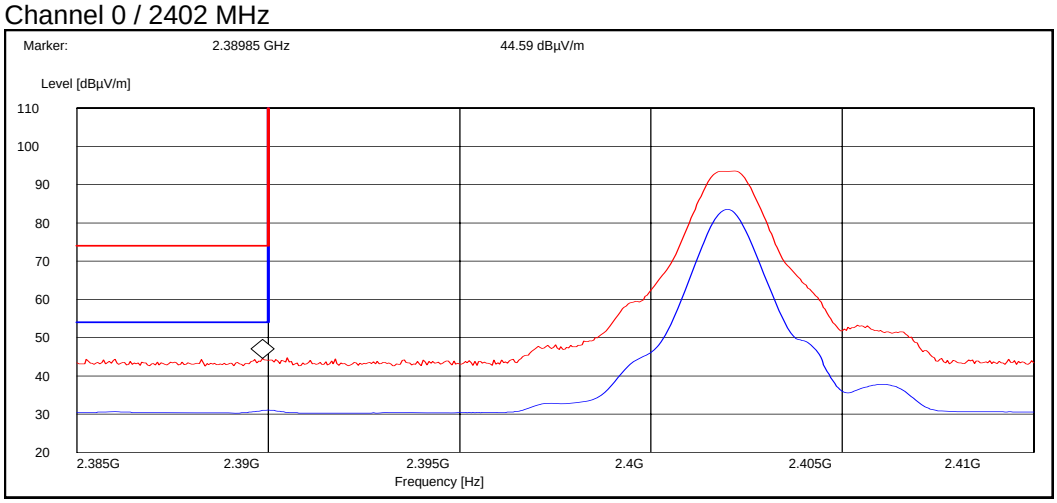
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	31.00	PASSED
78 / 2480	38.53	PASSED
Hopping on, low end	36.58	PASSED
Hopping on, high end	47.53	PASSED

Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	44.59	PASSED
78 / 2480	54.08	PASSED
Hopping on, low end	49.37	PASSED
Hopping on, high end	55.14	PASSED

Channel 0 / 2402 MHz



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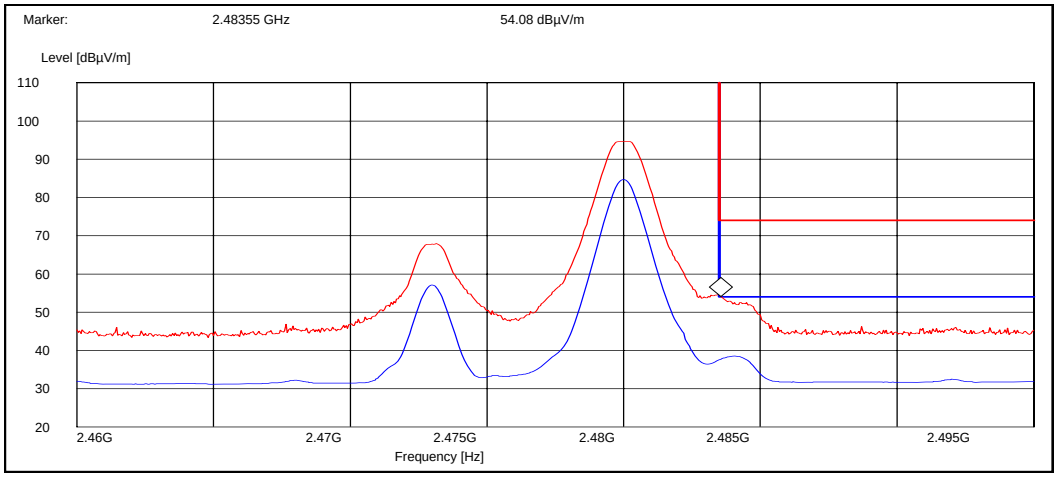
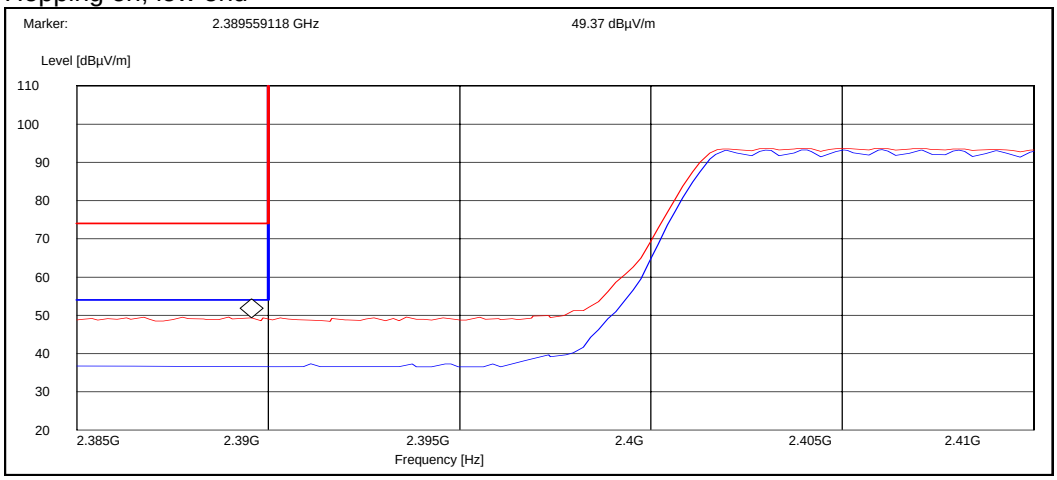
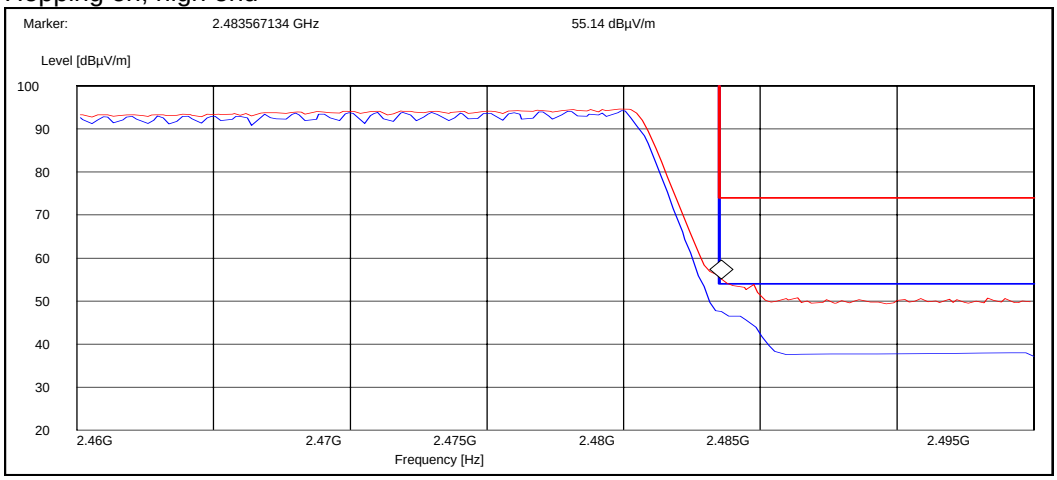
Channel 78 / 2480 MHz



Hopping on, low end



Hopping on, high end



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3.2.2 8DPSK modulation, PRBS packet type

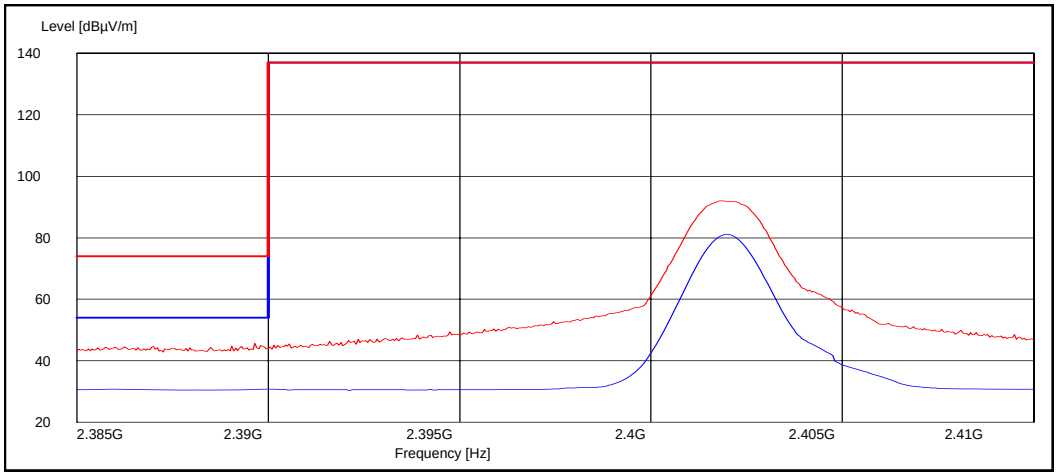
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	30.76	PASSED
78 / 2480	36.02	PASSED
Hopping on, low end	36.58	PASSED
Hopping on, high end	45.28	PASSED

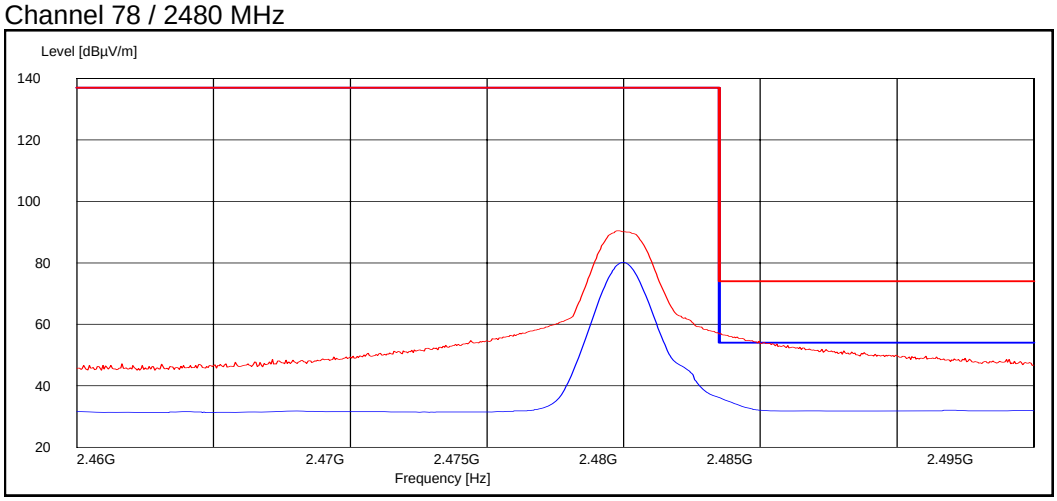
Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
0 / 2402	45.61	PASSED
78 / 2480	57.04	PASSED
Hopping on, low end	49.38	PASSED
Hopping on, high end	59.82	PASSED

Channel 0 / 2402 MHz



Channel 78 / 2480 MHz



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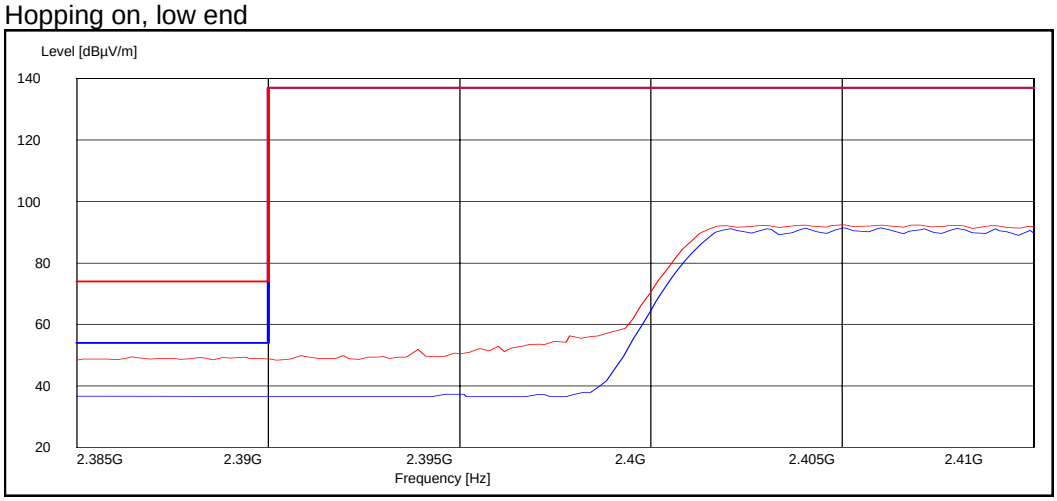
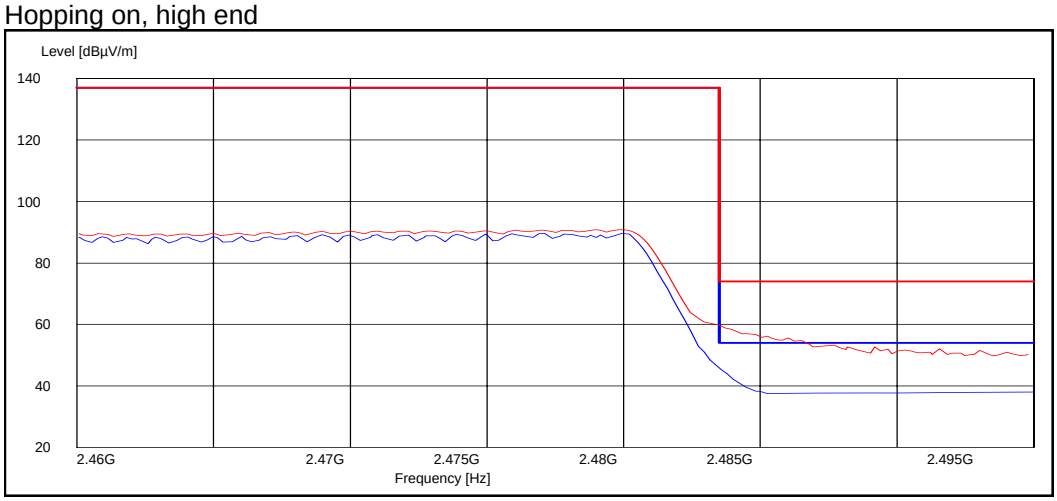
Hopping on, low end



Hopping on, high end



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4. Spurious radiated emissions

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

EUT with DUT number	RA-6 Dut #29112
Accessories with DUT numbers	BP-4L Dut #29113 + AC-4E Dut #29124 + HS-47 Dut #29122
Operation Voltage [V] / [Hz]	230 / 50
Result	PASSED
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	21.3 / 42.5 / 1031.3
Date of measurements	27-12-2006
Measured by	Jia Dongsheng & Christian Andersen

4.1. 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

4.2. Bluetooth Test results

4.2.1 GFSK modulation, PRBS packet type

Channel 0 / 2402 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4804.000000	51.90	393.55	53.90	-2.00	HORIZONTAL	PASSED
7206.000000	40.40	104.71	36.20	4.20	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4804.000000	42.60	134.90	44.60	-2.00	HORIZONTAL	PASSED
7206.000000	27.70	24.27	23.50	4.20	HORIZONTAL	PASSED

Channel 40 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
37.835872	31.70	38.46	49.60	-17.90	VERTICAL	PASSED

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4813.621242	51.40	371.54	53.50	-2.10	VERTICAL	PASSED
4822.649299	47.60	239.88	49.80	-2.20	VERTICAL	PASSED
4823.647295	51.60	380.19	53.80	-2.20	HORIZONTAL	PASSED
4824.141283	49.50	298.54	51.70	-2.20	VERTICAL	PASSED
4856.213427	50.40	331.13	52.50	-2.10	HORIZONTAL	PASSED
4874.251503	48.90	278.61	50.90	-2.00	HORIZONTAL	PASSED
7339.171343	40.50	105.93	35.90	4.60	VERTICAL	PASSED
7416.837675	41.80	123.03	36.80	5.00	VERTICAL	PASSED
17879.763527	58.00	794.33	32.60	25.40	VERTICAL	PASSED

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Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4812.621242	24.10	16.03	26.20	-2.10	VERTICAL	PASSED
4822.141283	24.40	16.60	26.60	-2.20	VERTICAL	PASSED
4822.647295	23.20	14.45	25.40	-2.20	HORIZONTAL	PASSED
4825.649299	24.10	16.03	26.30	-2.20	VERTICAL	PASSED
4853.213427	23.30	14.62	25.40	-2.10	HORIZONTAL	PASSED
4879.751503	23.80	15.49	25.80	-2.00	HORIZONTAL	PASSED
7339.671343	27.70	24.27	23.10	4.60	VERTICAL	PASSED
7417.337675	28.60	26.92	23.60	5.00	VERTICAL	PASSED
17879.763527	44.80	173.78	19.40	25.40	VERTICAL	PASSED

Channel 78 / 2480 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4960.000000	49.30	291.74	50.90	-1.60	HORIZONTAL	PASSED
7440.000000	40.60	107.15	35.70	4.90	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4960.000000	38.70	86.10	40.30	-1.60	HORIZONTAL	PASSED
7440.000000	28.70	27.23	23.80	4.90	HORIZONTAL	PASSED

4.2.2 8DPSK modulation, PRBS packet type

Channel 0 / 2402 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4804.000000	43.70	153.11	45.70	-2.00	VERTICAL	PASSED
7206.000000	39.70	96.61	35.50	4.20	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4804.000000	28.50	26.61	30.50	-2.00	VERTICAL	PASSED
7206.000000	26.80	21.88	22.60	4.20	VERTICAL	PASSED

Channel 40 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
30.300000	23.10	14.29	36.20	-13.10	VERTICAL	PASSED
38.176353	31.10	35.89	49.20	-18.10	VERTICAL	PASSED

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Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4884.267535	42.80	138.04	44.70	-1.90	HORIZONTAL	PASSED
4884.269539	42.80	138.04	44.70	-1.90	HORIZONTAL	PASSED
7313.121242	40.90	110.92	36.60	4.30	VERTICAL	PASSED
7322.641283	42.30	130.32	38.10	4.20	VERTICAL	PASSED
7420.341683	41.90	124.45	37.00	4.90	VERTICAL	PASSED
7428.855711	41.60	120.23	36.80	4.80	VERTICAL	PASSED
17865.739479	58.10	803.53	32.90	25.20	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4883.769539	27.20	22.91	29.10	-1.90	HORIZONTAL	PASSED
4884.267535	27.20	22.91	29.10	-1.90	HORIZONTAL	PASSED
7308.121242	28.00	25.12	23.60	4.40	VERTICAL	PASSED
7317.641283	28.20	25.70	23.90	4.30	VERTICAL	PASSED
7420.341683	29.10	28.51	24.20	4.90	VERTICAL	PASSED
7424.855711	28.90	27.86	24.10	4.80	VERTICAL	PASSED
17872.739479	45.10	179.89	19.70	25.40	VERTICAL	PASSED

Channel 78 / 2480 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4960.000000	42.60	134.90	44.20	-1.60	HORIZONTAL	PASSED
7440.000000	41.40	117.49	36.50	4.90	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4960.000000	26.70	21.63	28.30	-1.60	HORIZONTAL	PASSED
7440.000000	28.20	25.70	23.30	4.90	VERTICAL	PASSED

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5. AC powerline conducted emissions

(FCC §15.207, RSS-GEN 7.2.2)

EUT with DUT number	RA-6 Dut # 29112
Accessories with DUT numbers	BP-4L Dut # 29113 + AC-4E Dut # 29121 + HS-47 Dut # 29122
Operation Voltage [V] / [Hz]	230 / 50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	22.4 / 34.5 1019.9
Date of measurements	11-01-2007
Measured by	Allan F. Henriksen

5.1. 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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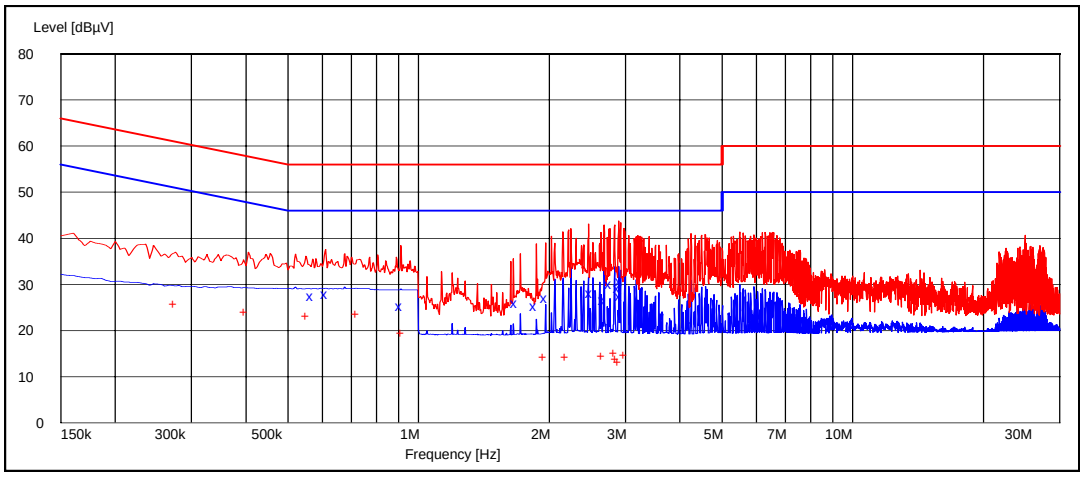
5.2. Bluetooth Test results

5.2.1 GFSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.570000	27.40	N	Passed
0.615000	27.80	N	Passed
0.915000	25.20	L1	Passed
1.680000	26.00	N	Passed
1.865000	25.40	N	Passed
1.970000	27.00	N	Passed
2.505000	28.10	L1	Passed
2.680000	26.70	L1	Passed
2.780000	30.20	L1	Passed
2.905000	29.30	N	Passed
2.930000	27.40	L1	Passed
2.935000	30.70	N	Passed

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.275000	25.70	N	Passed
0.400000	24.10	L1	Passed
0.555000	23.20	L1	Passed
0.725000	23.50	N	Passed
0.920000	19.50	L1	Passed
1.955000	14.20	N	Passed
2.200000	14.30	N	Passed
2.665000	14.50	N	Passed
2.850000	15.10	N	Passed
2.870000	13.90	L1	Passed
2.905000	13.30	L1	Passed
3.000000	14.70	N	Passed

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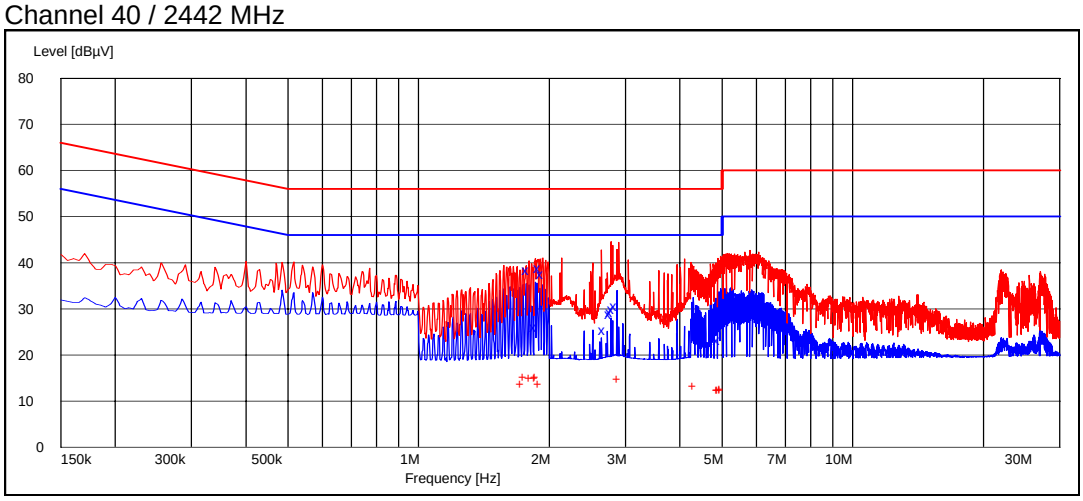
5.2.2 8DPSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
1.790000	38.40	N	Passed
1.865000	26.10	N	Passed
1.905000	38.80	N	Passed
1.935000	37.50	N	Passed
2.680000	25.40	L1	Passed
2.775000	28.90	N	Passed
2.795000	29.40	N	Passed
2.820000	30.00	N	Passed
2.860000	30.60	N	Passed
4.935000	23.20	L1	Passed

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
1.735000	13.60	N	Passed
1.760000	15.20	N	Passed
1.815000	15.00	N	Passed
1.870000	15.00	N	Passed
1.875000	15.20	N	Passed
1.905000	13.70	L1	Passed
2.895000	14.80	N	Passed
4.325000	13.20	N	Passed
4.920000	12.50	N	Passed
4.935000	12.50	N	Passed
4.990000	12.60	N	Passed
4.995000	12.50	N	Passed

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6. Band edge compliance of RF emissions

(FCC §15.247(c), RSS-210 A8.5)

EUT with DUT number	RA-6 Dut #29112
Accessories with DUT numbers	BP-4L Dut #29113 + AC-4E Dut #29124 + HS-47 Dut #29122
Operation Voltage [V] / [Hz]	230 / 50
Result	PASSED
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	21.7 / 40.5 / 1028.3
Date of measurements	29-12-2006
Measured by	Jia Dongsheng

6.1. 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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6.2. WLAN Test results

6.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

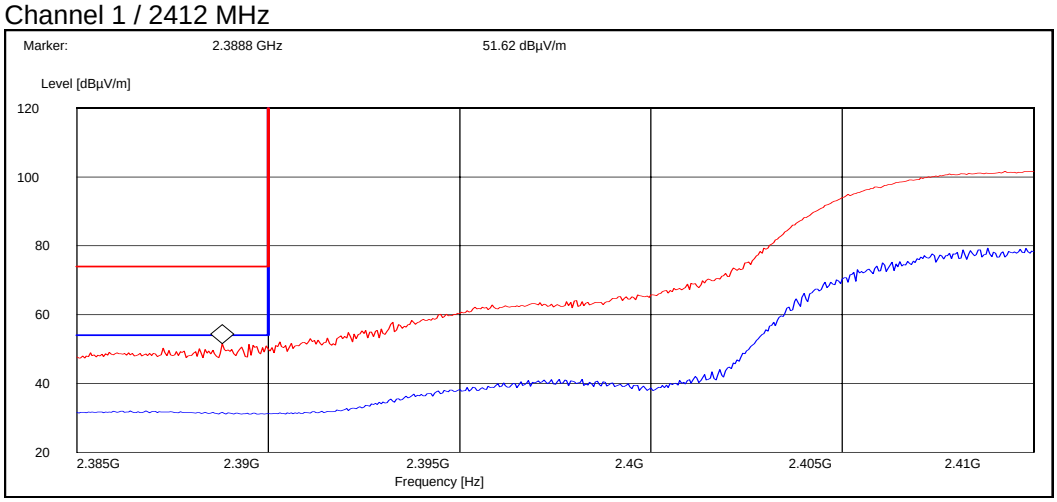
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
1 / 2412	31.65	PASSED
11 / 2462	34.27	PASSED

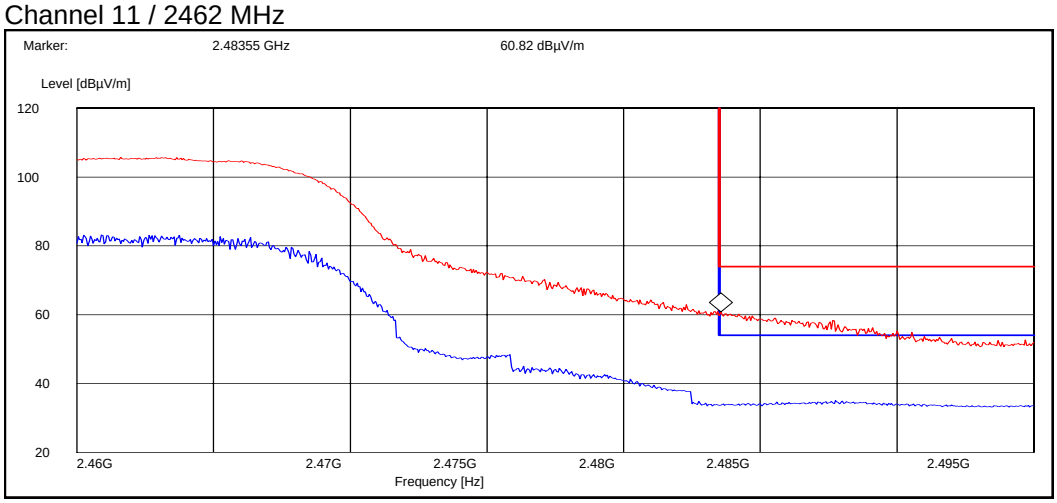
Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
1 / 2412	51.62	PASSED
11 / 2462	60.82	PASSED

Channel 1 / 2412 MHz



Channel 11 / 2462 MHz



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6.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

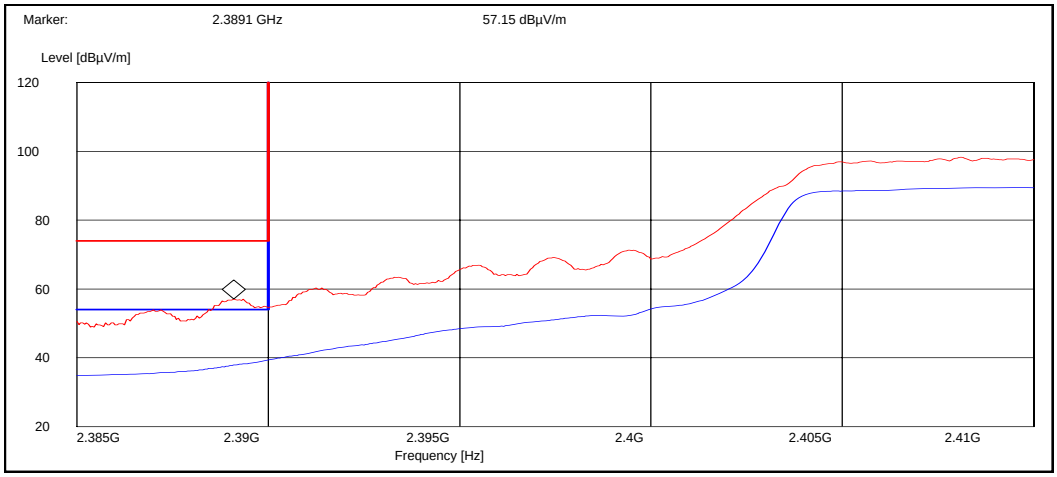
Average (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
1 / 2412	39.26	PASSED
11 / 2462	46.17	PASSED

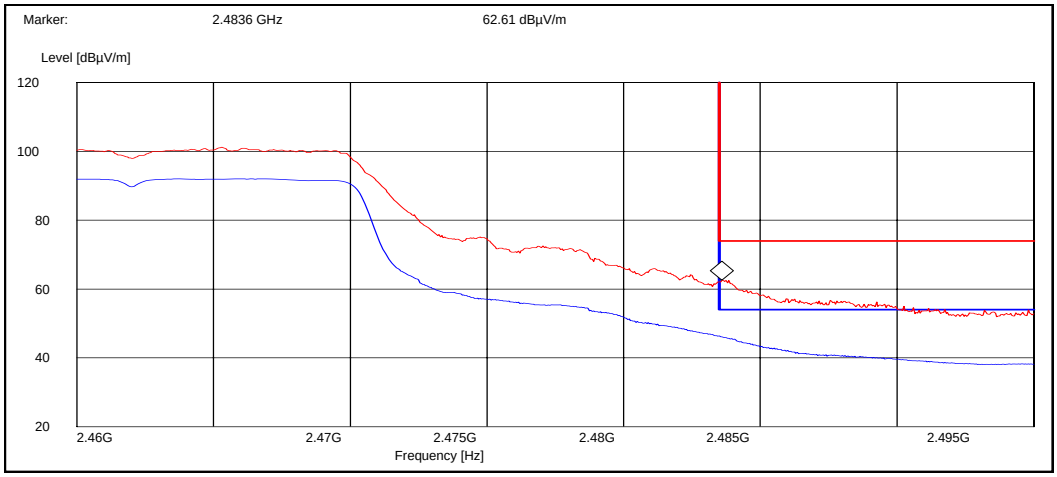
Peak (RBW: 1 MHz)

Channel / f_C [MHz]	E [dBµV/m]	Result
1 / 2412	57.15	PASSED
11 / 2462	62.61	PASSED

Channel 1 / 2412 MHz



Channel 11 / 2462 MHz



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7. Spurious radiated emissions

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

EUT with DUT number	RA-6 Dut #29112
Accessories with DUT numbers	BP-4L Dut #29113 + AC-4E Dut #29124 + HS-47 Dut #29122
Operation Voltage [V] / [Hz]	230 / 50
Result	PASSED
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	21.3 / 42.5 / 1029.4
Date of measurements	28-12-2006
Measured by	Jia Dongsheng

7.1. 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

7.2. WLAN Test results

7.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 1 / 2412 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4824.000000	36.20	64.57	38.40	-2.20	VERTICAL	PASSED
7236.000000	40.10	101.16	36.10	4.00	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4824.000000	23.30	14.62	25.50	-2.20	VERTICAL	PASSED
7236.000000	27.50	23.71	23.50	4.00	VERTICAL	PASSED

Channel 7 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
37.776353	28.40	26.30	46.20	-17.80	VERTICAL	PASSED

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4884.269539	40.00	100.00	41.90	-1.90	VERTICAL	PASSED
7320.145291	40.80	109.65	36.60	4.20	VERTICAL	PASSED
7340.181363	40.50	105.93	35.90	4.60	VERTICAL	PASSED
7423.341683	41.10	113.50	36.30	4.80	VERTICAL	PASSED
17881.259519	57.30	732.82	31.90	25.40	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4883.769539	24.40	16.60	26.30	-1.90	VERTICAL	PASSED
7321.145291	27.60	23.99	23.40	4.20	VERTICAL	PASSED
7339.681363	27.70	24.27	23.10	4.60	VERTICAL	PASSED
7420.841683	28.60	26.92	23.70	4.90	VERTICAL	PASSED

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17879.759519	44.60	169.82	19.20	25.40	HORIZONTAL	PASSED

Channel 11 / 2462 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4924.000000	36.80	69.18	38.20	-1.40	VERTICAL	PASSED
7386.000000	41.10	113.50	36.10	5.00	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4924.000000	24.10	16.03	25.50	-1.40	VERTICAL	PASSED
7386.000000	27.20	22.91	22.20	5.00	VERTICAL	PASSED

7.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 1 / 2412 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4824.000000	35.80	61.66	38.00	-2.20	HORIZONTAL	PASSED
7236.000000	40.30	103.51	36.30	4.00	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4824.000000	23.60	15.14	25.80	-2.20	VERTICAL	PASSED
7236.000000	27.70	24.27	23.70	4.00	VERTICAL	PASSED

Channel 7 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
38.095391	24.80	17.38	42.80	-18.00	VERTICAL	PASSED
55.131463	14.90	5.56	44.60	-29.70	VERTICAL	PASSED

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
7313.133267	41.10	113.50	36.80	4.30	VERTICAL	PASSED
7338.673347	40.20	102.33	35.60	4.60	VERTICAL	PASSED
7413.333667	41.00	112.20	35.90	5.10	VERTICAL	PASSED
17878.755511	58.00	794.33	32.60	25.40	HORIZONTAL	PASSED

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Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
7315.633267	27.50	23.71	23.20	4.30	VERTICAL	PASSED
7340.673347	27.60	23.99	22.90	4.70	VERTICAL	PASSED
7412.833667	28.20	25.70	23.10	5.10	VERTICAL	PASSED
17878.255511	44.70	171.79	19.30	25.40	HORIZONTAL	PASSED

Channel 11 / 2462 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4924.000000	37.40	74.13	38.80	-1.40	VERTICAL	PASSED
7386.000000	40.10	101.16	35.10	5.00	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4924.000000	25.10	17.99	26.50	-1.40	VERTICAL	PASSED
7386.000000	27.70	24.27	22.70	5.00	VERTICAL	PASSED

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8. AC powerline conducted emissions

(FCC §15.207, RSS-GEN 7.2.2)

EUT with DUT number	RA-6 Dut # 29112
Accessories with DUT numbers	BP-4L Dut # 29113 + AC-4E Dut # 29121 + HS-47 Dut # 29122
Operation Voltage [V] / [Hz]	230 / 50
Result	Passed
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [mBar]	22.4 / 34.5 1019.9
Date of measurements	04-01-2007
Measured by	Allan F. Henriksen

8.1. 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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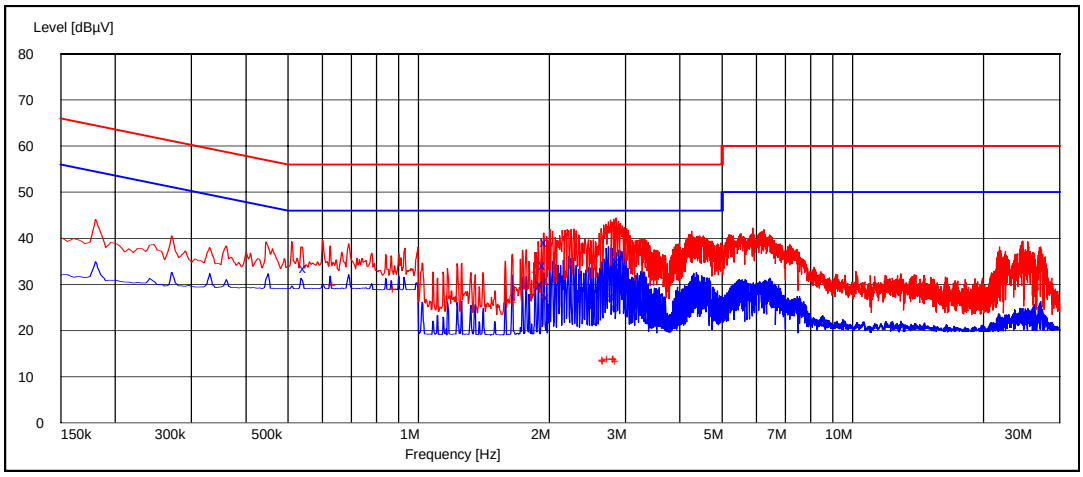
8.2. WLAN Test results

8.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 7 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.550000	33.60	L1	Passed
1.935000	30.10	L1	Passed
1.955000	34.20	N	Passed
1.970000	39.20	L1	Passed
1.995000	27.20	L1	Passed
2.745000	28.40	L1	Passed
2.835000	27.50	N	Passed
2.840000	32.40	L1	Passed
2.865000	25.10	N	Passed
2.870000	32.50	L1	Passed
2.900000	35.10	L1	Passed

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.640000	30.00	N	Passed
0.885000	29.00	N	Passed
1.670000	26.10	L1	Passed
1.885000	32.70	N	Passed
1.945000	34.90	N	Passed
1.980000	27.40	N	Passed
2.680000	13.60	N	Passed
2.690000	13.50	N	Passed
2.750000	13.80	N	Passed
2.840000	13.90	N	Passed
2.845000	13.80	N	Passed
2.875000	13.50	N	Passed

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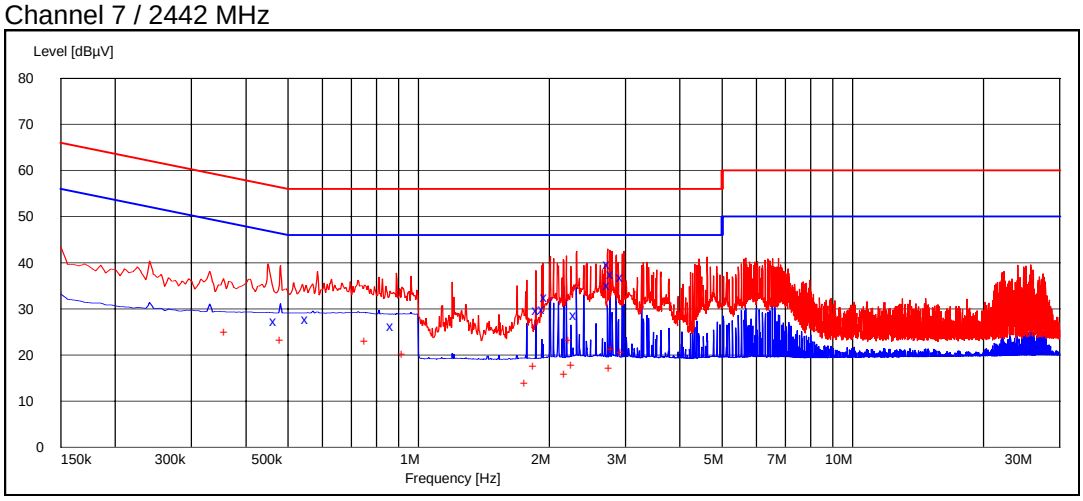
8.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 7 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.470000	27.40	L1	Passed
0.555000	27.70	N	Passed
0.875000	26.30	N	Passed
1.890000	29.70	N	Passed
1.950000	29.90	L1	Passed
1.975000	32.50	L1	Passed
2.310000	28.60	L1	Passed
2.750000	39.60	N	Passed
2.755000	35.20	L1	Passed
2.810000	37.50	N	Passed
2.955000	36.80	N	Passed

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.360000	24.90	L1	Passed
0.485000	23.30	N	Passed
0.760000	23.10	L1	Passed
0.925000	20.10	L1	Passed
1.775000	13.80	N	Passed
1.860000	17.60	N	Passed
2.190000	15.90	N	Passed
2.240000	23.30	N	Passed
2.275000	17.70	N	Passed
2.780000	17.00	N	Passed
2.805000	21.30	L1	Passed
2.955000	20.50	L1	Passed

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9. Test Equipment

9.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
13037	Power Supply 0-15V 10A	EA3012	LP Instruments	15C, 15B
13513	Pulse Limiter 9KHz-30MHz	ESH3Z2	Rohde&Schwarz	15C, 15B
13666	EMI Test Reciever 9KHz-2,5GHz	ESPC	Rohde&Schwarz	15C, 15B
13935	Two Lines Artificial Mains Network	ESH3-Z5	Rohde&Schwarz	15C, 15B
16995	Directional Coupler 20dB 0,5-2,0 GHz SMA Conn.	1538RA-20	Weinschel	15C, 15B
18772	Shielded Chamber	RFD-100	ETS-Lindgren	15C, 15B
19171	Universal Radio Communication Tester	CMU200	Rohde&Schwarz	15C, 15B
11386	System DC Power Supply	HP6632A	Hewlett Packard	22/24, 15C, 15B
19678	Spectrum Analyzer 26 GHz	FSP	Rohde&Schwarz	22/24, 15C, 15B
16601	Universal Radio Communication Tester	CMU200	Rohde&Schwarz	22/24, 15C, 15B
19625	Vötsch Climatic Chamber	VT4002EMC	Vötsch	22/24, 15C, 15B
13357	Rohde & Schwartz Signal Generator	SMP02	Rohde&Schwarz	22/24, 15C, 15B

9.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
18416	Universal Radio Communication Tester	CMU200	Rohde&Schwarz	22/24, 15C, 15B
	Programmable Relay Switching System	----------	Pickering	22/24, 15C, 15B
15742	Programmable Relay Switching System	----------	Pickering	22/24, 15C, 15B
14020	Power Supply Module Relay Switching System 45W	10-910-002	Pickering	22/24, 15C, 15B
15743	Power Supply Module Relay Switching System 50W	10-910L-001	Pickering	22/24, 15C, 15B
16490	RS-232/IEEE-488.2 Interface	10-921-001	Pickering	22/24, 15C, 15B
	RS-232/IEEE-488.2 Interface	10-921-001	Pickering	22/24, 15C, 15B
20078	Relay 2x6 Chnl µWave Mux	10-785B-522	Pickering	22/24, 15C, 15B
14021	Relay Dual 6 Chnl µWave Mux	10-785-522		22/24, 15C, 15B
	Relay Dual 6 Chnl µWave Mux	10-785-522		22/24, 15C, 15B
17644	Dual 6 Channel MUX Microwave Relay SMA 50 Ohm	10-785-522	Pickering	22/24, 15C, 15B
16948	Dual 6 Channel MUX Microwave Relay SMA 50 Ohm	10-785-522	Pickering	22/24, 15C, 15B
16949	Dual 6 Channel MUX Microwave Relay SMA 50 Ohm	10-785-522	Pickering	22/24, 15C, 15B
18792	Multi Device Controller	2090	ETS-EMCO	22/24, 15C, 15B
14963	RF Preamplifier 100MHz-4GHz (Metal Chassis)	AFS3-00100400	Miteq/NMP Cph	22/24, 15C, 15B
18861	EMI Test Receiver 20Hz-26,5GHz	ESI	Rohde&Schwarz	22/24, 15C, 15B

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Eq. No	Equipment	Type	Manufacturer	Used in
18860	Ultra Broadband Antenna Ultralog 30-3000MHz	HL562	Rohde&Schwarz	22/24, 15C, 15B
19830	Ultra Broadband Antenna Ultralog 30-3000MHz	HL562	Rohde&Schwarz	22/24, 15C, 15B
18773	Shielded Chamber	RFD-100	ETS-Lindgren	22/24, 15C, 15B
18774	Shielded Chamber	RFSD-F/A-100	ETS-Lindgren	22/24, 15C, 15B
19151	High Pass Filter 3GHz WHK3.0/18G-10ss	WHJS3000-10SS	Wainwright	22/24, 15C, 15B
13937	Ultra Stable Notch Filter 850MHz	WRCA902.4-0.2/40-6SS	Wainwright Instruments	22/24, 15C, 15B
13936	Ultra Stable Notch Filter 1747,5MHz	WRCD1747.5-0.2/40-10SS	Wainwright Instruments	22/24, 15C, 15B
13917	Highpass Filter 1000-3000MHz 50OHM SMA Conn	WHKS1000-10SS	Wainwright Instruments	22/24, 15C, 15B
14188	Ultra Stable Notch Filter 902,4MHz	WRCA902.4-0.2/40-6SS	Wainwright	22/24, 15C, 15B
14187	Ultra Stable Notch Filter 1747,5MHz	WRCD1747.5-0.2/40-10SS	Wainwright	22/24, 15C, 15B
16633	Ultra Stable Notch Filter 1880,0MHz	WRCD1880.0-0.2/40-10SS	Wainwright	22/24, 15C, 15B
19587	BT/WLAN Band Reject Filter	WRCG2400/2483-2390/2493-35/10SS	Wainwright	22/24, 15C, 15B
	WDCMA Band 4 filter	WRCG1737/1743-1733/1747-40/6SS	Wainwright	22/24, 15C, 15B
	WDCMA Band 5&6 filter	WRCG832/83/-825/845-40/5SS	Wainwright	22/24, 15C, 15B
	WDCMA Band 8 filter	WRCG894.6/900.6-890.6/904.6-40/80SS	Wainwright	22/24, 15C, 15B
18323	Band reject filter 1947-1953MHz 40dB	WRCG1947/1953-1940/1960-40/6SS	Wainwright	22/24, 15C, 15B
20031	Double Ridged Broadband Horn	BBHA 9120 D	SCHWARZBECK	22/24, 15C, 15B
15190	Infra Red Remote Control Unit	4630	Emco	22/24, 15C, 15B
14993	EMI Test Receiver 9KHz-2750MHz	ESCS30	Rohde&Schwarz	22/24, 15C, 15B
15191	Turntable Contoller Unit	G-800SDX	YAESU	22/24, 15C, 15B
14900	Antenna Controller	HD100	HD GmbH	22/24, 15C, 15B
15105	Attenuator 30dB DC-1000MHz 50 Ohm Nf - Nm	NAT-30	Mini-Circuits	22/24, 15C, 15B
13302	Spectrum Analyzer 9KHz-12.8GHz	HP8596E	Hewlett Packard	22/24, 15C, 15B
11584	Spectrum analyzer 50Hz-6,5GHz	HP8561B	Hewlett Packard	22/24, 15C, 15B
13134	Tracking generator	HP85645A	Hewlett Packard	22/24, 15C, 15B
19374	Resonant Dipole Antenna 850MHz SMA m Conn.	---------	NMP Cph	22/24, 15C, 15B
19375	Resonant Dipole Antenna 1900MHz SMA m Conn.	----------	NMP Cph	22/24, 15C, 15B
11487	Network analyzer 300KHz-3,0GHz	HP8753A	Hewlett Packard	22/24, 15C, 15B
14807	S - Parameter Test Set 300KHz-6GHz	HP85047A	Hewlett Packard	22/24, 15C, 15B
17277	Multimeter Digital 6 1/2 Digit	AT34401A	Agilent Technologies	22/24, 15C, 15B

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