

FCC Part 15C Compliance Test Report

Test Report no.:	FCC15C_RM-614_04.doc	Date of Report:	24-Mar-2010
Number of pages:	14	Customer's Contact person:	Helen Hu
Testing laboratory:	TCC Nokia Beijing Laboratory Beijing Economic and Technological Development Area No.5 Donghuan Zhonglu Beijing PRC China 100176 Tel. +86 10 8711 8888 Fax. +86 10 8711 4550	Customer:	Nokia Corporation Beijing Economic and Technological Development Area No.5 Donghuan Zhonglu Beijing PRC China 100176 Tel. +86 10 8711 8888 Fax. +86 10 8711 4550
FCC listing no.:	975940		
IC recognition no.:	661AH-1		
Tested devices/ accessories:	Phone RM-614 / Battery BL-5J / AC-charger AC-3E / Headset WH-102		
FCC ID:	QTLRM-614	IC:	661AB-RM614
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:			

Jia Dongsheng, System Manager

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	25-Jan-2010
Testing completed	05-Mar-2010
The customer's contact person	Helen Hu
Test Plan referred to	T:\Projects\RM-614\TestPlan_RS\RS_testplan_RM-614.xls
Notes	-
Document name	FCC15C_RM-614_04.doc

1.1. EUT and Accessory Information

The EUT is a 4-band (GSM850/900/1800/1900) 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-614	008600080028904	0201	-	ag92_10w03	51575
Battery	BL-5J	4620409503I20270596;0670574	-	-	-	51580
AC-charger	AC-3E	4090499161171601911;0675370	-	-	-	51585
Headset	WH-102	0694323923554107290	-	-	-	51587

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

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	NP
15.247(d)	A8.5	Band edge compliance of RF emissions	PASSED
15.247(d)	A8.5	Spurious RF conducted emissions	NP
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	NP
15.247(e)	A8.2 (b)	Power spectral density	NP

PASSED

FAILED

NP

The EUT complies with the essential requirements in the standard.

The EUT does not comply with the essential requirements in the standard.

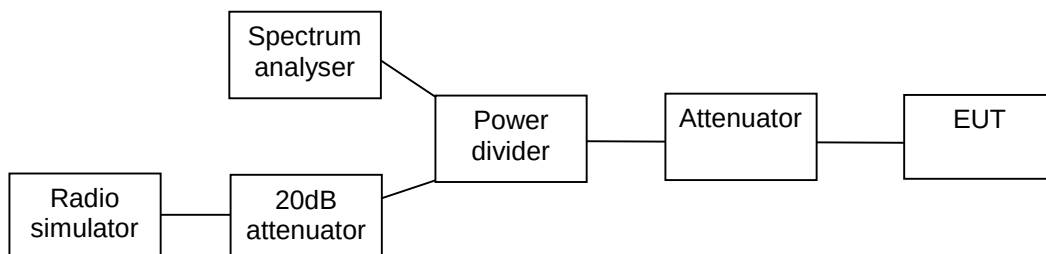
The test was not performed by the TCC Nokia Beijing Laboratory.

CONTENTS

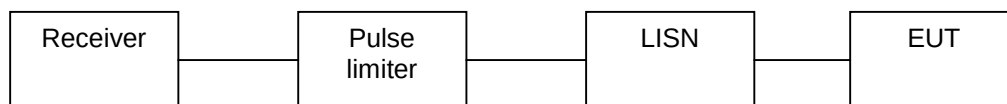
1. Summary for FCC Part 15C Compliance Test Report.....	2
1.1. EUT and Accessory Information	2
1.2. Summary of Test Results	2
2. Test setups.....	4
2.1. Conducted RF test setup	4
2.2. AC powerline conducted emissions test setup.....	4
2.3. Radiated test setup	4
3. Band edge compliance of RF emissions (FCC §15.247(d), RSS-210 A8.5).....	5
3.1. Test method and limit.....	5
3.2. WLAN Test results	6
4. Spurious radiated emissions (FCC §15.247(d), §15.209, RSS-210 A8.5).....	8
4.1. Test method and limit.....	8
4.2. WLAN Test results	9
5. AC powerline conducted emissions (FCC §15.207, RSS-GEN 7.2.2)	12
5.1. Test method and limit.....	12
5.2. WLAN Test results	13
6. Test Equipment.....	14
6.1. Conducted measurements	14
6.2. Radiated measurements	14

2. Test setups

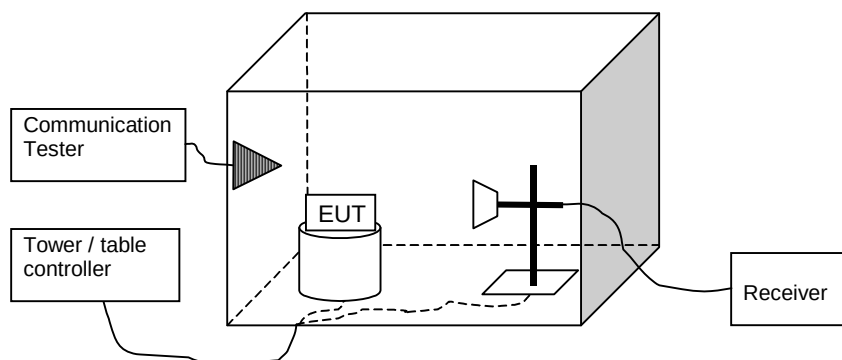
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Radiated test setup



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

EUT with DUT number	RM-614, DUT51575
Accessories with DUT numbers	BL-5J, DUT51580; AC-3E, DUT51585; WH-102, DUT51587
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	19 / 39 / 101.6
Date of measurements	03-Mar-2010
Measured by	Zou Ming

3.1. Test method and limit

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

The measurement results are obtained as described below:

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

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

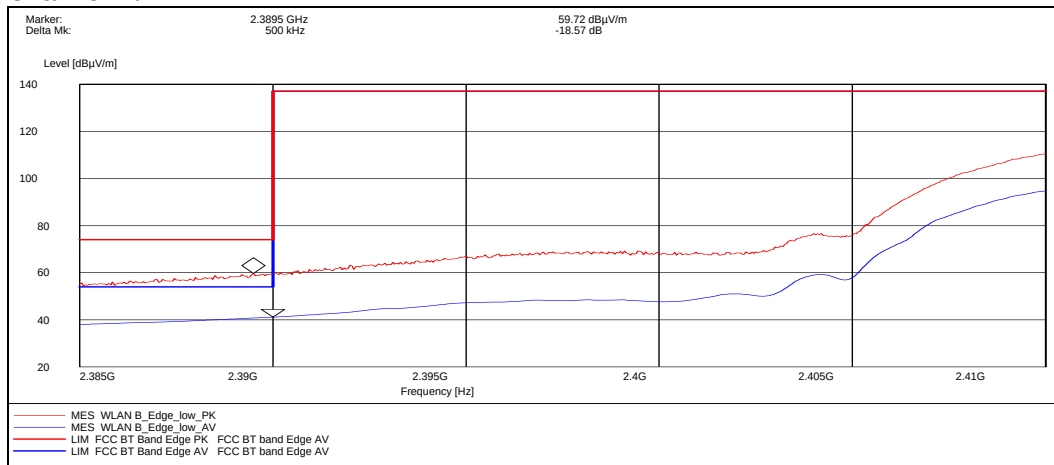
Limits for band edge compliance of RF emissions measurements (3 m measurement distance)

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

3.2. WLAN Test results

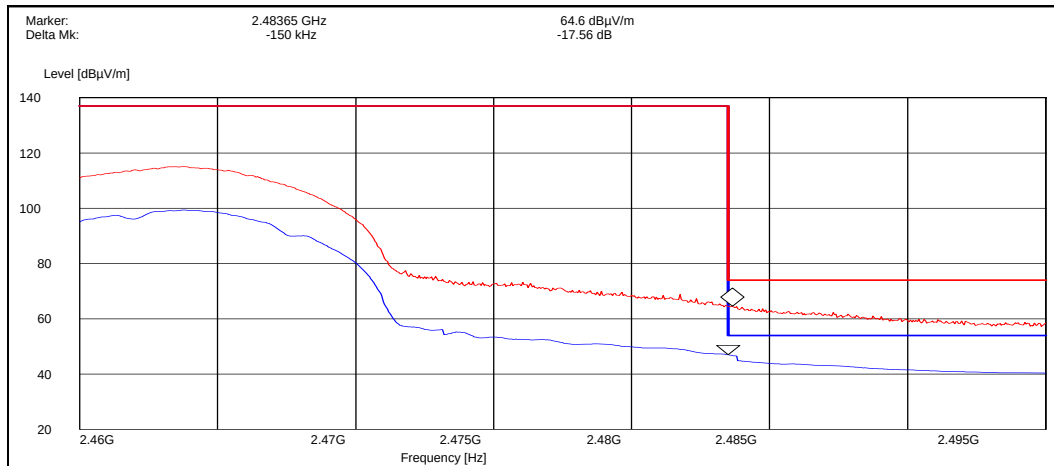
3.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 1 / 2412 MHz



Detector (RBW: 1 MHz, VBW: 1MHz)	E [dBμV/m]	Result
Peak	59.70	PASSED
Average	41.10	PASSED

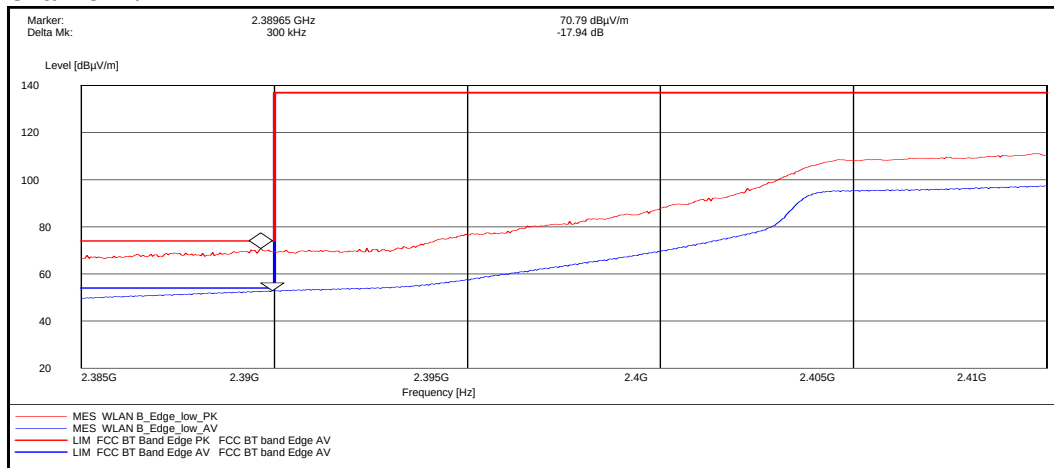
Channel 11 / 2462 MHz



Detector (RBW: 1 MHz, VBW: 1MHz)	E [dBμV/m]	Result
Peak	64.60	PASSED
Average	47.00	PASSED

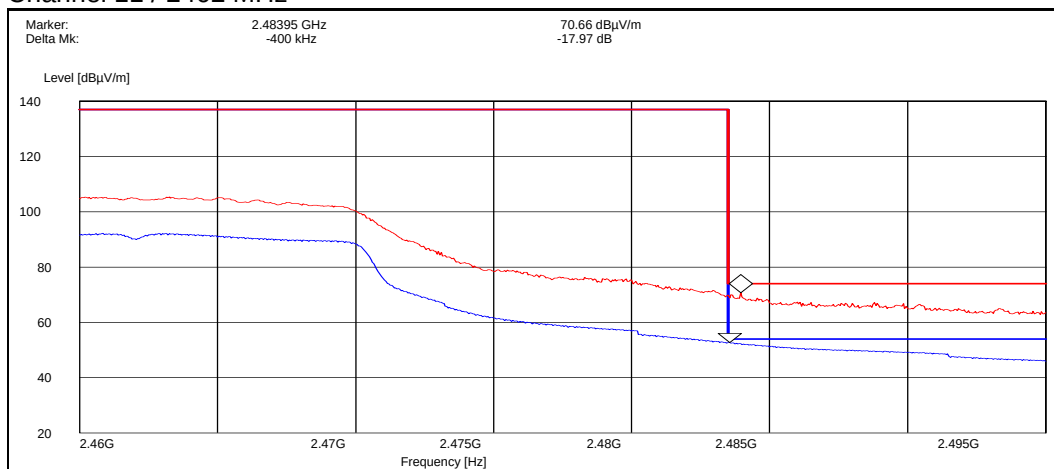
3.2.2 OFDM mode, BPSK modulation, 6 Mbps data rate

Channel 1 / 2412 MHz



Detector (RBW: 1 MHz, VBW: 1MHz)	E [dBμV/m]	Result
Peak	70.80	PASSED
Average	52.80	PASSED

Channel 11 / 2462 MHz



Detector (RBW: 1 MHz, VBW: 1MHz)	E [dBμV/m]	Result
Peak	70.70	PASSED
Average	52.70	PASSED

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

EUT with DUT number	RM-614, DUT51575
Accessories with DUT numbers	BL-5J, DUT51580; AC-3E, DUT51585; WH-102, DUT51587
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 34 / 101.4
Date of measurements	25-Feb-2010
Measured by	Jia Dongsheng

4.1. 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 ($A_{TOT} = L_{CABLES} + AF - G_{PREAMP}$).

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

Frequency range [MHz]	Limit [$\mu\text{V/m}$]	Limit [dB $\mu\text{V/m}$]	Detector
30 – 88	100	40	Quasi peak
88 – 216	150	43.5	Quasi peak
216 – 960	200	46	Quasi peak
960 – 1000	500	54	Quasi peak
Above 1000	500	54	Average
Above 1000	5000	74	Peak

4.2. WLAN Test results

4.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 1 / 2412 MHz

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

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	40.30	103.51	40.50	-0.2	VERTICAL	PASSED
7236.000000	43.20	144.54	38.90	4.3	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	27.40	23.44	27.60	-0.2	HORIZONTAL	PASSED
7236.000000	30.60	33.88	26.30	4.3	HORIZONTAL	PASSED

Channel 7 / 2442 MHz

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

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
37.595391	27.20	22.91	42.30	-15.1	VERTICAL	PASSED
74.948497	28.00	25.12	54.80	-26.8	HORIZONTAL	PASSED
75.169940	28.10	25.41	54.90	-26.8	HORIZONTAL	PASSED

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

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
2363.211423	60.60	1,071.52	55.40	5.2	VERTICAL	PASSED
2492.512024	59.90	988.55	53.00	6.9	VERTICAL	PASSED
2495.548096	59.30	922.57	52.60	6.7	VERTICAL	PASSED
2826.407816	53.10	451.86	42.30	10.8	HORIZONTAL	PASSED
4870.247495	40.90	110.92	40.70	0.2	VERTICAL	PASSED
7330.153307	43.40	147.91	39.00	4.4	HORIZONTAL	PASSED
7372.743487	43.50	149.62	39.00	4.5	VERTICAL	PASSED
7383.269539	43.50	149.62	39.00	4.5	VERTICAL	PASSED
17464.931864	53.10	451.86	36.50	16.6	HORIZONTAL	PASSED
17964.431864	55.10	568.85	35.50	19.6	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2363.711423	45.90	197.24	40.70	5.2	VERTICAL	PASSED
2492.012024	42.40	131.83	35.40	7.0	VERTICAL	PASSED
2496.548096	41.90	124.45	35.20	6.7	VERTICAL	PASSED
2821.407816	39.90	98.86	29.10	10.8	HORIZONTAL	PASSED
4873.247495	28.00	25.12	27.80	0.2	VERTICAL	PASSED
7326.653307	30.60	33.88	26.20	4.4	HORIZONTAL	PASSED
7373.243487	30.80	34.67	26.30	4.5	VERTICAL	PASSED
7381.769539	30.80	34.67	26.30	4.5	VERTICAL	PASSED
17465.431864	39.70	96.61	23.10	16.6	HORIZONTAL	PASSED
17966.931864	42.70	136.46	23.10	19.6	VERTICAL	PASSED

Channel 11 / 2462 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	41.70	121.62	41.00	0.7	VERTICAL	PASSED
7386.000000	43.70	153.11	39.20	4.5	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	28.70	27.23	28.00	0.7	VERTICAL	PASSED
7386.000000	31.00	35.48	26.50	4.5	VERTICAL	PASSED

4.2.2 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	40.20	102.33	40.40	-0.2	VERTICAL	PASSED
7236.000000	44.00	158.49	39.70	4.3	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4824.000000	27.40	23.44	27.60	-0.2	HORIZONTAL	PASSED
7236.000000	30.60	33.88	26.30	4.3	HORIZONTAL	PASSED

Channel 7 / 2442 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
37.595391	27.30	23.17	42.40	-15.1	VERTICAL	PASSED
74.948497	28.70	27.23	55.50	-26.8	HORIZONTAL	PASSED
75.169940	26.80	21.88	53.60	-26.8	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
2361.896794	61.80	1,230.27	56.60	5.2	VERTICAL	PASSED
2387.456914	64.00	1,584.89	58.60	5.4	VERTICAL	PASSED
2491.000000	65.40	1,862.09	58.30	7.1	VERTICAL	PASSED
2495.548096	64.30	1,640.59	57.60	6.7	VERTICAL	PASSED
2823.931864	52.60	426.58	41.80	10.8	HORIZONTAL	PASSED
4925.849699	41.20	114.82	40.60	0.6	VERTICAL	PASSED
7315.133267	43.60	151.36	39.10	4.5	VERTICAL	PASSED
7375.757515	43.60	151.36	39.10	4.5	VERTICAL	PASSED
17475.947896	53.00	446.68	36.20	16.8	VERTICAL	PASSED
17950.903808	55.70	609.54	35.90	19.8	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2361.896794	47.20	229.09	42.00	5.2	VERTICAL	PASSED
2386.956914	45.90	197.24	40.50	5.4	VERTICAL	PASSED
2491.000000	47.20	229.09	40.10	7.1	VERTICAL	PASSED
2495.048096	46.20	204.17	39.50	6.7	VERTICAL	PASSED
2824.931864	40.00	100.00	29.20	10.8	HORIZONTAL	PASSED
4922.849699	28.40	26.30	27.70	0.7	VERTICAL	PASSED
7315.633267	30.60	33.88	26.10	4.5	VERTICAL	PASSED
7381.757515	30.80	34.67	26.30	4.5	VERTICAL	PASSED
17471.947896	39.80	97.72	23.00	16.8	VERTICAL	PASSED
17955.403808	42.80	138.04	23.00	19.8	HORIZONTAL	PASSED

Channel 11 / 2462 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	41.20	114.82	40.50	0.7	VERTICAL	PASSED
7386.000000	43.70	153.11	39.20	4.5	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4924.000000	28.60	26.92	27.90	0.7	HORIZONTAL	PASSED
7386.000000	31.00	35.48	26.50	4.5	HORIZONTAL	PASSED

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

EUT with DUT number	RM-614, DUT51575
Accessories with DUT numbers	BL-5J, DUT51580; AC-3E, DUT51585; WH-102, DUT51587
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 30 / 102.7
Date of measurements	05-Mar-2010
Measured by	Jia Dongsheng

5.1. 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.

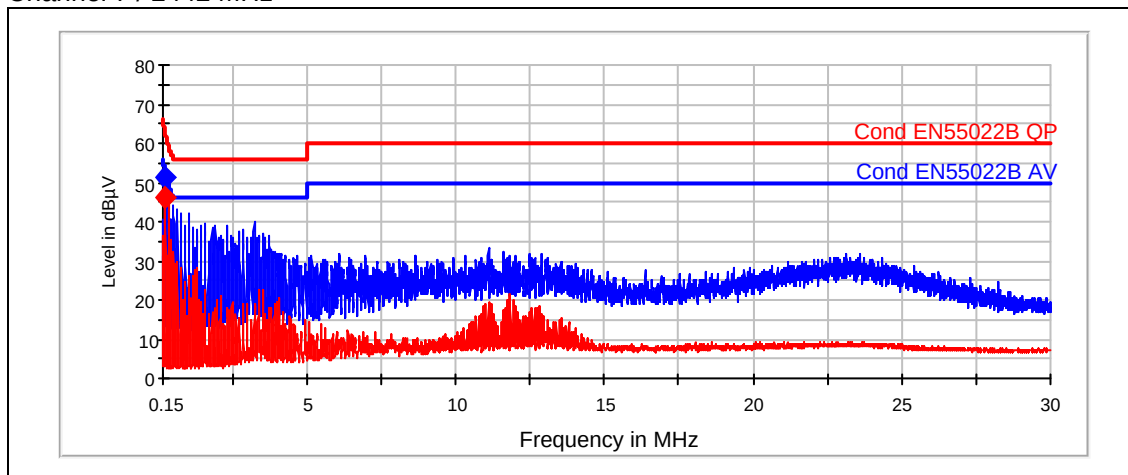
CISPR 22 Class B limits

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

5.2. WLAN Test results

5.2.1 DSSS mode, QPSK modulation, 11 Mbps data rate

Channel 7 / 2442 MHz



Quasi peak

Frequency[MHz]	Level [dBμV]	Meas. time[ms]	IF-BW[kHz]	Line	Margin	Result
0.245	51.53	15000	9	N	10.42	PASSED

Average

Frequency[MHz]	Level [dBμV]	Meas. time[ms]	IF-BW[kHz]	Line	Margin	Result
0.245	46.23	15000	9	N	5.72	PASSED

6. Test Equipment

6.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
BJPCPT0073	SIGNAL GENERATOR	SMR 20	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCTC0055	RADIO COMMUNICATION TESTER	CMU200	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCPT0039	LISN	ESH3-Z5	Rohde&Schwarz	15C, 15B
BJPCPT0040	TEST RECEIVER	ESCS30	Rohde&Schwarz	15C, 15B
BJPCPT0069	LISN	ESH3-Z5	Rohde&Schwarz	15C, 15B
BJPCPT0079	LISN	ESH3-Z5	Rohde&Schwarz	15C, 15B
BJPCPT0191	PULSE LIMITER	ESH3-Z2	Rohde&Schwarz	15C, 15B
BJPCPT0131	RADIO COMMUNICATION TESTER	CMU200	ROHDE&SCHWARZ	15C, 15B
BJPCTC0089	Temperature Test chamber	VT4002	Vötsch Industrietechnik	22/24/27, 15C
BJPCTC0090	FSP spectrum analyzer	FSP30	R&S	22/24/27, 15C
BJPCTC0067	BLUETOOTH TESTER	CBT	R&S	22/24/27, 15C
BJPCHW0020	Dc Power supply	Hp6632B	HP	22/24/27, 15C
BJPCTC0094	GPB-RS232 convertor	GPB-RS232	National Instruments	22/24/27, 15C

6.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
BJPCPT0129	Relay Unit	TS-RSP	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCPT0130	Relay Unit	TS-RSP	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCPT0080	Device Controller	EMCO2090	ETS-EMCO	22/24/27, 15C, 15B
BJPCTC0048	RF Preamplifier 10MHz-3GHz (Metal chassis)	AFS4-00100300-10-10P-4	MITEQ	22/24/27, 15C, 15B
BJPCTC0007	Ultra Broadband Antenna 30MHz-3000MHz	HL562	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCPT0162	Horn Antenna 1GHz-18GHz	HF906	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCTC0029	Horn Antenna 1GHz-18GHz	HF906	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCTC0049	RF preamplifier 3GHz-18GHz	BLMA-0118-1A-BT	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCTC0072	3m anechoic chamber	-	ETS-Lindgren	22/24/27, 15C, 15B
BJPCTC0075	Turntable	Model 2088	ETS-EMCO	22/24/27, 15C, 15B
BJPCPT0072	EMI Test Receiver 20Hz-26.5GHz	ESIB26	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCPT0150	High Pass filter	WHKS 1200-10SS	Wainwright instruments	22/24/27, 15C, 15B
BJPCTC0034	Notch Filter	WRCT800/880-0.2/40-5SSK	Wainwright instruments	22, 15B
BJPCPT0151	Notch Filter	WRCD1800/2000-0.2/40-5SSK	Wainwright instruments	24, 15B
BJPCTC0017	Radio Communication Tester	CMU200	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCPT0154	Filter	WRCT2402/2480-2400/2483.5-30-20SS	Wainwright instruments	15C, 15B
BJPCTC0058	Bluetooth tester	CBT	Rohde&Schwarz	15C, 15B
BJPCTC0064	WCDMA II FILTER	WRCG1877/1883-1870/1890-40/6SS	Wainwright instruments	24, 15B
BJPCTC0065	WCDMA V FILTER	WRCG832/838-825/845-40/5SS	Wainwright instruments	22, 15B
BJPCTC0066	ANTENNA	SBA9113	SWARZBECK	22/24/27
BJPCTC0096	RF Preamplifier 100MHz-3GHz	AFS4-00100300-20-23P-6	MITEQ	22/24/27, 15C, 15B