

FCC Part 22/24 Compliance Test Report

Test Report no.:	FCC22&24_RM-844_02.docx	Date of Report:	13-Jun-2012
Number of pages:	14	Customer's Contact person:	Zhang Wei
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-844 / Battery BL-4U / AC Charger AC-11E / Headset WH-102 / Dummy battery SD-52		
FCC ID:	QTLRM-844	IC:	661AB-RM844
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Parts 22/24 , TIA-603-C-2004 and IC standards, RSS-GEN (Issue 3, December 2010), RSS-132 (Issue 2, September 2005), RSS-133 (Issue 5, February 2009). 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:			

Zou Ming, Engineer, EMC

1. Summary for FCC Part 22/24 Compliance Test Report

Date of receipt	23-May-2012
Testing completed	07-Jun-2012
The customer's contact person	Zhang Wei
Test Plan referred to	T:\Projects\RM-844\TestPlan\RS_testplan_RM-844.xls
Notes	-
Document name	FCC22&24_RM-844_02.docx

1.1. EUT and Accessory Information

The EUT is a mobile phone with following features:

GSM/WLAN/Bluetooth

The EUT is tested with maximum rated TX power, modulated with pseudo random bit sequence (PRBS9).

Devices under tests

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-844	004402138816180	0204	-	tn12w19	52736
Battery	BL-4U	4955402032021202713;0670560	-	-	-	52733
AC Charger	AC-11E	4090491466160502525;0675479	-	-	-	52735
Headset	WH-102	0694323152311D02963	-	-	-	52734
Phone	RM-844	004402138815299	0204	-	tn12w19	52740
Battery	BL-4U	4955402032021202846;0670560	-	-	-	52750
AC-Charger	AC-11E	4090491466160502548;0675479	-	-	-	52754
Headset	WH-102	0694323152311D23538	-	-	-	52755
Phone	RM-844	004402138815463	0204	-	tn12w19	52742
Dummy battery	SD-52	22.12.2011/03618	-	-	-	52757

1.2. Summary of Test Results

GSM850:

Section in CFR 47	Section in RSS-GEN or RSS-132	Name of the test	Result
§2.1046(a), 22.913(a)	4.4	Conducted RF output power	NP
§22.913(a)	4.4	Radiated RF output power	NP
§2.1049(h)	4.6.1	99 % occupied bandwidth	PASSED
§22.917(a)	4.5	Band edge compliance	NP
§22.917(a), §2.1051	4.5	Spurious emissions at antenna terminals	NP
§22.917(a), §2.1053	4.5	Spurious radiated emissions	PASSED
§2.1055(a)	4.3	Frequency stability, temperature variation	PASSED
§2.1055(d)	4.3	Frequency stability, voltage variation	PASSED

GSM1900:

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§24.232(b)	6.4	Radiated RF output power	NP
§2.1049(h)	4.6.1	99 % occupied bandwidth	PASSED
§24.238(a)	6.5	Band edge compliance	NP
§24.238(a), §2.1051	6.5	Spurious emissions at antenna terminals	NP
§24.238(a), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	PASSED
§2.1055(d)	6.3	Frequency stability, voltage variation	PASSED

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 Laboratory.

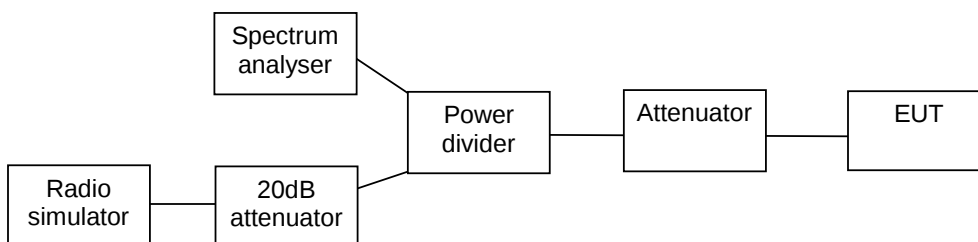
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2. 99% occupied bandwidth (FCC §2.1049(h), RSS-GEN 4.6.1)

EUT with DUT number	RM-844, DUT 52740
Accessories with DUT numbers	BL-4U, DUT 52750 ; AC-11E, DUT 52754 ; WH-102, DUT 52755
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23/44/101.3
Date of measurements	30-May-2012
Measured by	Gao Sherina

2.1. Test Setup



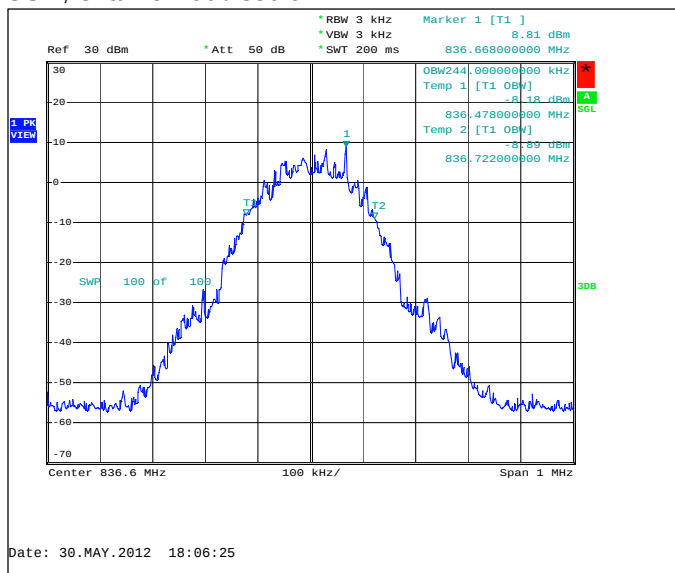
2.2. Test method and limit

The measurement is made according to FCC rules parts 22, 24 and IC standard RSS-GEN.

2.3. GSM 850 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
GSM	244

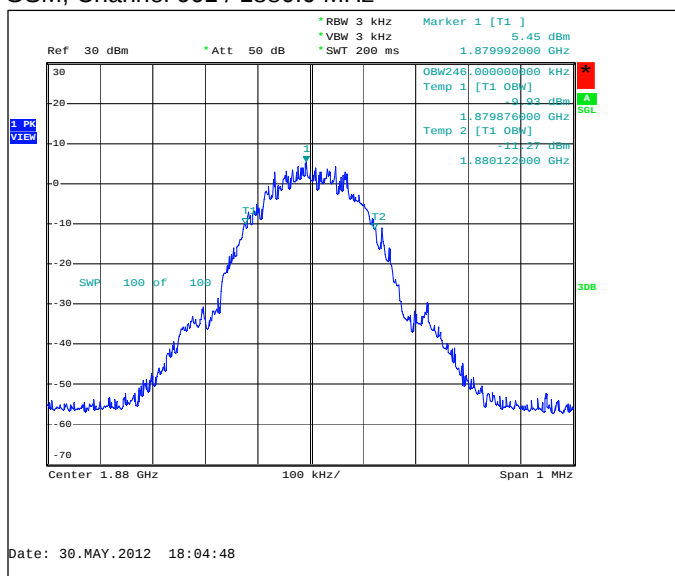
GSM, Channel 190 / 836.6 MHz



2.4. GSM 1900 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
GSM	246

GSM, Channel 661 / 1880.0 MHz

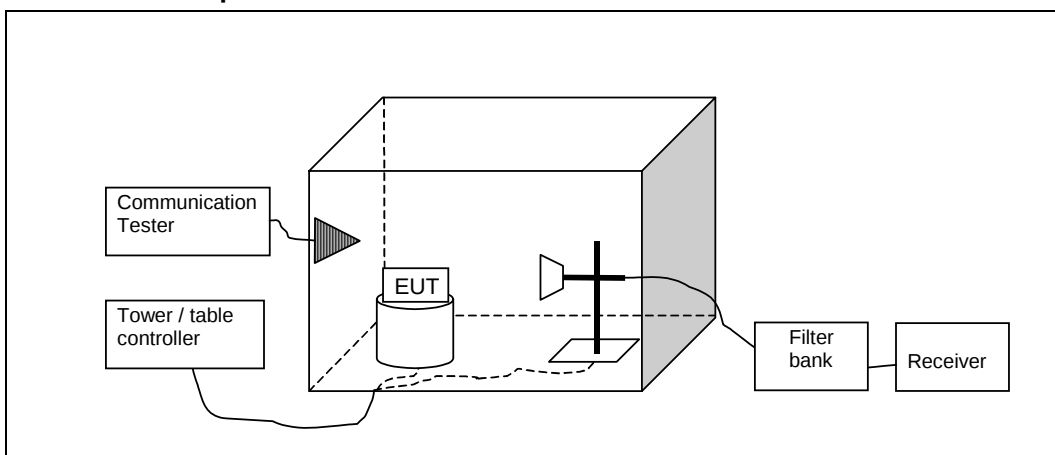


3. Spurious radiated emissions

(FCC §22.917(a), §2.1053, §24.238(a), §2.1053, RSS-132 4.5, RSS-133 6.5)

EUT with DUT number	RM-844, DUT 52736
Accessories with DUT numbers	BL-4U, DUT 52733 ; AC-11E, DUT 52735 ; WH-102, DUT 52734
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	25/53/99.6
Date of measurements	07-Jun-2012
Measured by	Zou Ming

3.1.1 Test Setup



3.2. Test method and limit

The measurement is made according to TIA-603-C-2004 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 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 substitution method is used. Substitution values at each frequencies are measured beforehand and saved to the test software. The substitution corrections are obtained as described below:

$$ASUBST = PSUBST\ TX - PSUBST\ RX - LSUBST\ CABLES + GSUBST\ TX\ ANT$$

Where ASUBST is the final substitution correction including receive antenna gain. PSUBST TX is signal generator level, PSUBST RX is receiver level, LSUBST CABLES is cable losses including both

TX and RX cables and GSUBST TX ANT is substitution antenna gain.

The measurement results are obtained as described below:

$$P[\text{dBm}] = \text{PMEAS} + \text{ATOT}$$

Where PMEAS is receiver reading in dBm and ATOT is total correction factor including cable loss and substitution correction ($\text{ATOT} = \text{LCABLES} - \text{GPREAMP} + \text{ASUBST}$).

Limits for spurious radiated emissions measurements

Operation band	Frequency range [MHz]	Limit [dBm]
GSM 850 / WCDMA 850	30 - 8500	-13
GSM 1900 / WCDMA 1900 WCDMA 1700 / LTE 1700	30 - 18000	-13

3.3. GSM850 TX Test results

GSM mode, Channel 190 / 836.6 MHz

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
849.126	-72.19	6E-05	-71.01	-1.18	VERTICAL	PASSED
1672.986	-47.02	0.01986	-51.88	4.86	VERTICAL	PASSED
1673.226	-46.54	0.02218	-51.25	4.71	HORIZONTAL	PASSED
2509.78	-39.76	0.10568	-51.8	12.04	VERTICAL	PASSED
2509.94	-39.56	0.11066	-51.59	12.03	VERTICAL	PASSED
3313.868	-55.04	0.00313	-63.89	8.85	HORIZONTAL	PASSED

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

3.4. GSM1900 TX Test results

GSM mode, Channel 661 / 1880.0 MHz

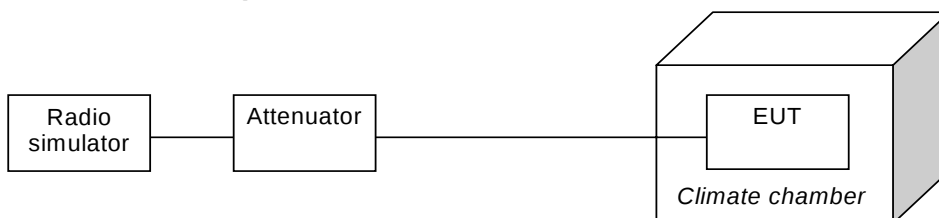
Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
2826.065	-45.36	0.02911	-63.27	17.91	VERTICAL	PASSED
2902.56	-45.11	0.03083	-63.71	18.6	HORIZONTAL	PASSED
2904.494	-45.12	0.03076	-63.85	18.73	HORIZONTAL	PASSED
2907.334	-43.4	0.04571	-62.49	19.09	VERTICAL	PASSED
2919.521	-44.95	0.03199	-63.68	18.73	HORIZONTAL	PASSED
2989.94	-44.1	0.0389	-63	18.9	VERTICAL	PASSED

*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

4. Frequency stability, temperature variation (FCC §2.1055(a), RSS-132 4.3, RSS-133 6.3)

EUT with DUT number	RM-844, DUT 52740
Accessories with DUT numbers	BL-4U, DUT 52750 ; AC-11E, DUT 52754 ; WH-102, DUT 52755
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23/44/101.3
Date of measurements	30-May-2012
Measured by	Gao Sherina

4.1. Test Setup



4.2. Test method and limit

The measurement is made according to FCC rules parts 22, 24 and IC standard RSS-132, RSS-133 as follows:

The climate chamber temperature is set to the maximum value and the temperature is allowed to stabilize.

The EUT is placed in the chamber.

The EUT is set in idle mode for 15 minutes.

The EUT is set to transmit.

The transmit frequency error was measured immediately.

The steps c - e were repeated for each temperature. Limits for frequency stability, temperature variation measurements

Frequency deviation [ppm]
+/- 2.5

4.3. GSM 850 Test results

GSM, Channel 190 / 836.6 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	836.6	-7.49	-0.009	PASSED
40	836.6	-12.46	-0.0149	PASSED
30	836.6	-7.55	-0.009	PASSED
20	836.6	-3.42	-0.0041	PASSED
10	836.6	-18.98	-0.0227	PASSED
0	836.6	-7.62	-0.0091	PASSED
-10	836.6	-8.98	-0.0107	PASSED
-20	836.6	-3.36	-0.004	PASSED
-22	836.6	-3.1	-0.0037	PASSED

4.4. GSM 1900 Test results

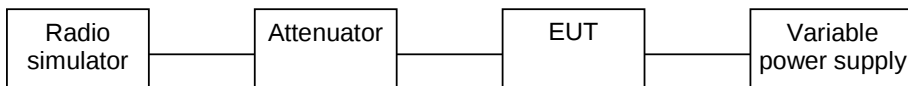
GSM, Channel 661 / 1880.0 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	1880	-5.62	-0.003	PASSED
40	1880	-3.75	-0.002	PASSED
30	1880	1.68	0.0009	PASSED
20	1880	-20.92	-0.0111	PASSED
10	1880	2.84	0.0015	PASSED
0	1880	-5.36	-0.0029	PASSED
-10	1880	17.24	0.0092	PASSED
-20	1880	8.91	0.0047	PASSED
-22	1880	-4.26	-0.0023	PASSED

5. Frequency stability, voltage variation (FCC §2.1055(d), RSS-132 4.3, RSS-133 6.3)

EUT with DUT number	RM-844, DUT 52742
Accessories with DUT numbers	SD-52, DUT 52757
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24/55/99.9
Date of measurements	04-Jun-2012
Measured by	Gao Sherina

5.1. Test Setup



5.2. Test method and limit

The measurement is made according to FCC rules parts 22, 24 and IC standard RSS-132, RSS-133 as follows:

The EUT battery was replaced with an adjustable power supply. The frequency stability was measured at nominal voltage and at the battery cut-off point.

Limits for frequency stability, voltage variation measurements

Frequency deviation [ppm]
+/- 2.5

5.3. GSM 850 Test results

GSM, Channel 190 / 836.6 MHz

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.1	836.6	1.16	0.0014	PASSED
Nominal / 4.1	836.6	-8.52	-0.0102	PASSED
Battery cut-off point / 3.7	836.6	-1.1	-0.0013	PASSED

5.4. GSM 1900 Test results

GSM, Channel 661 / 1880.0 MHz

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.1	1880	0.84	0.0004	PASSED
Nominal / 4.1	1880	-4.46	-0.0024	PASSED
Battery cut-off point / 3.7	1880	-1.94	-0.001	PASSED

6. Test Equipment

6.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
-	RF Emission Software	EMC32 Test Software	R&S	22/24/27, 15C, 15B
BJPCHW0020	DC Power supply	Hp6632B	HP	22/24/27, 15C
BJPCPT0040	Receiver	ESCS30	R&S	15C, 15B
BJPCPT0069	LISN 50 μ H	ESH3-Z5	R&S	15C, 15B
BJPCPT0073	Signal Generator	SMR 20	R&S	22/24/27, 15C, 15B
BJPCPT0191	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
BJPCTC0017	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
BJPCTC0067	Bluetooth Tester	CBT	R&S	22/24/27, 15C
BJPCTC0089	Temperature Test chamber	VT4002	Votsch industrietechnik	22/24/27, 15C
BJPCTC0090	FSP spectrum analyzer	FSP30	R&S	22/24/27, 15C
BJPCTC0094	GPIO-RS232 convertor	GPIO-RS232	NI	22/24/27, 15C
BJPCTC0112	Power Splitter	11667B	Agilent	22/24/27, 15C
BJPCTC0114	Signal Generator	E8257C	Agilent	22/24/27, 15C
BJPCTC0115	Communication Tester	CMU200	R&S	22/24/27, 15B, 15C

6.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	RF Emission Software	EMC32 Test Software	R&S	22/24/27, 15C, 15B
BJPCPT0072	Receiver	ESI B26	R&S	22/24/27, 15C, 15B
BJPCPT0130	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
BJPCPT0150	High Pass Filter	WHKS1200-10SS	Wainwright	22/24/27, 15C, 15B
BJPCPT0151	Band Reject Filter	WRCD1880/2000-0.2/40-5SSK	Wainwright	24, 15B
BJPCPT0154	Band Reject Filter	WRCT2402/2480-2400/2483.5-30-20SS	Wainwright	15C, 15B
BJPCPT0162	Antenna	HF906	R&S	22/24/27, 15C, 15B
BJPCTC0007	Antenna	HL562	R&S	22/24/27, 15C, 15B
BJPCTC0029	Antenna	HF906	R&S	22/24/27, 15C, 15B
BJPCTC0034	Band Reject Filter	WRCT 800/880-0.2/40-5SSK	Wainwright	22, 15B
BJPCTC0049	Preamplifier	Blma 0118-1A-Bt	Bonn	22/24/27, 15C, 15B
BJPCTC0055	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
BJPCTC0058	Bluetooth Tester	CBT	R&S	15C, 15B
BJPCTC0064	Band Reject Filter	WRCG1877/1883-1870/1890-40/6SS	Wainwright	24, 15B
BJPCTC0065	Band Reject Filter	WRCG832/838-825/845-40/5SS	Wainwright	27, 15B
BJPCTC0071	Multi-Device Controller	2090	EMCO	22/24/27, 15C, 15B
BJPCTC0072	Anechoic Chamber	3 m Semi / Full Anechoic Chamber	ETS	22/24/27, 15C, 15B
BJPCTC0073	MAST	Model-TR/POL	ETS	22/24/27, 15C, 15B
BJPCTC0074	MAST	Model 2070-2	ETS	22/24/27, 15C, 15B
BJPCTC0075	Turntable	Model 2188	ETS-EMCO	22/24/27, 15C, 15B
BJPCTC0096	Preamplifier	AFS4-00100300-20-23P-6	Miteq	22/24/27, 15C, 15B
BJPCTC0113	Receiver	ESI B26	R&S	22/24/27, 15B, 15C
BJPCTC0115	Communication Tester	CMU200	R&S	22/24/27, 15B, 15C
BJPCTC0124	Attenuator	SA18N200W-40	Fairview Microwave	-