

FCC Part 22/24 Compliance Test Report

Test Report no.:	FCC22&24_RM-864_03.docx	Date of Report:	04-Sep-2012
Number of pages:	15	Customer's Contact person:	Wang Jason
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-864 / Battery BL-5C / AC-Charger AC-11E / Headset WH-109 / Dummy battery SD-4MOD		
FCC ID:	QTLRM-864	IC:	661AB-RM864
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:			
	Gao Sherina, Engineer, EMC		

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

Date of receipt	27-Aug-2012
Testing completed	30-Aug-2012
The customer's contact person	Wang Jason
Test Plan referred to	T:\Projects\RM-864\TestPlan\RS_testplan_RM-864.xlsm
Notes	-
Document name	FCC22&24_RM-864_03.docx

1.1. EUT and Accessory Information

The EUT is a mobile phone with following features:
GSM/Bluetooth
The EUT is tested with maximum rated TX power.

Devices under tests

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-864	004402139616365	0302	-	esECL_12w33	52846
Battery	BL-5C	0670650437995S044110609884	-	-	-	52840
AC-Charger	AC-11E	4868672071240518706;0675479	-	-	-	52830
Headset	WH-109	660	0.1	0.2	-	52843
Dummy battery	SD-4MOD	09.02.2012/03618	-	-	-	52832
Phone	RM-864	004402139615680	0302	-	esECL_12w33	52845
Battery	BL-5C	0670650437995S044110609873	-	-	-	52841
AC-charger	AC-11E	4090491452160503514;0675479	-	-	-	52842
Headset	WH-109	772	0.1	0.2	-	52831

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	NP
§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

The EUT complies with the essential requirements in the standard.

FAILED
NP

The EUT does not comply with the essential requirements in the standard.
The test was not performed by the TCC Nokia Laboratory.

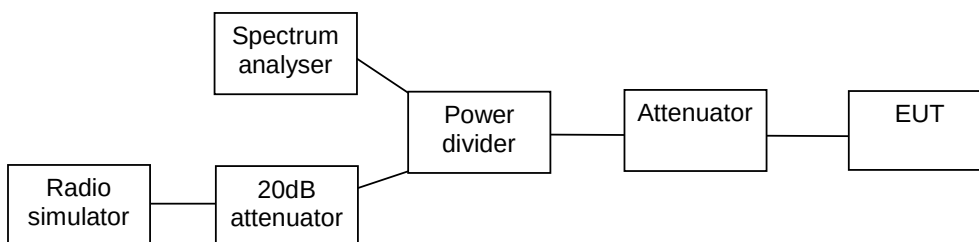
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2. 99% occupied bandwidth (FCC §2.1049(h), RSS-GEN 4.6.1)

EUT with DUT number	RM-864, DUT 52846
Accessories with DUT numbers	BL-5C, DUT 52840 ; AC-11E, DUT 52830 ; WH-109, DUT 52843
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22/70/100.7
Date of measurements	29-Aug-2012
Measured by	Gao Sherina

2.1. Test Setup



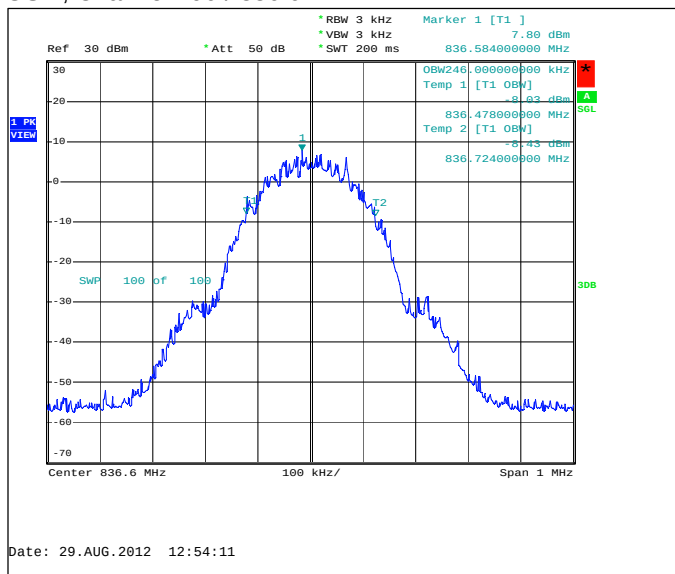
2.2. Test method and limit

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	246

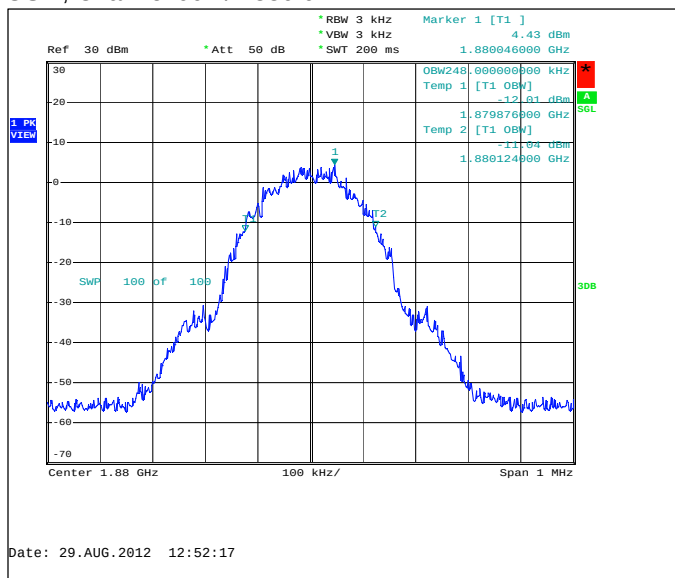
GSM, Channel 190 / 836.6 MHz



2.4. GSM 1900 Test results

Operation mode (TX on)	99% Occupied bandwidth [kHz]
GSM	248

GSM, Channel 661 / 1880.0 MHz

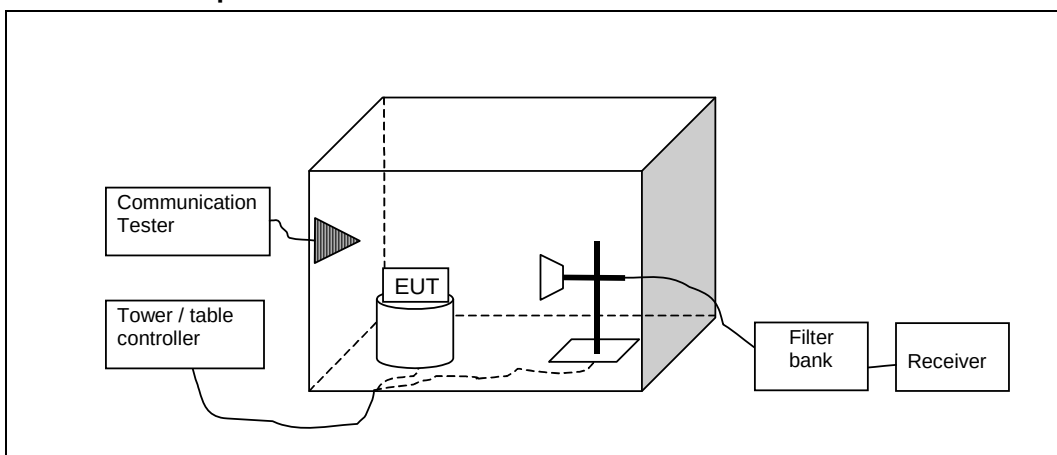


3. Spurious radiated emissions

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

EUT with DUT number	RM-864, DUT 52845
Accessories with DUT numbers	BL-5C, DUT 52841 ; AC-11E, DUT 52842 ; WH-109, DUT 52831
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 60 / 100.5
Date of measurements	29-Aug-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]
GSM850	30 - 8500	-13
GSM1900	30 - 18000	-13

3.3. GSM1900 TX test results

GSM mode, Channel 661 / 1880.0 MHz

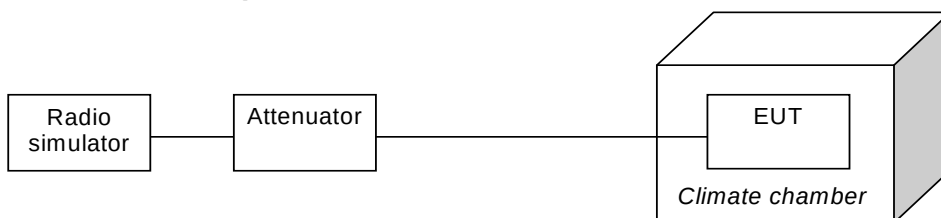
Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarization	Results
2460.281	-49.42	0.01143	-63.69	14.27	VERTICAL	PASSED
2886.186	-44.96	0.03194	-63.89	18.93	HORIZONTAL	PASSED
2906.918	-44.52	0.03534	-63.41	18.89	HORIZONTAL	PASSED
2908.6	-43.37	0.04602	-62.49	19.12	VERTICAL	PASSED
2948.193	-45.61	0.0275	-64.3	18.69	VERTICAL	PASSED
9644.81	-46.8	0.0209	-66.57	19.77	HORIZONTAL	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-864, DUT 52846
Accessories with DUT numbers	BL-5C, DUT 52840 ; AC-11E, DUT 52830 ; WH-109, DUT 52843
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22/70/100.7
Date of measurements	29-Aug-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	-13.24	-0.0158	PASSED
40	836.6	-5.49	-0.0066	PASSED
30	836.6	-1.36	-0.0016	PASSED
20	836.6	-6.39	-0.0076	PASSED
10	836.6	-1.1	-0.0013	PASSED
0	836.6	-2	-0.0024	PASSED
-10	836.6	-9.43	-0.0113	PASSED
-20	836.6	-4.71	-0.0056	PASSED
-30	836.6	-2.45	-0.0029	PASSED

4.4. GSM 1900 Test results

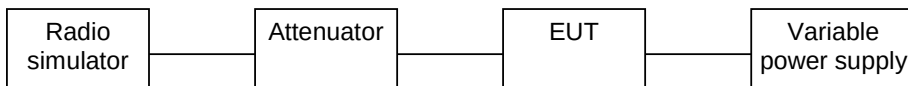
GSM, Channel 661 / 1880.0 MHz

Temperature [°C]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
50	1880	5.62	0.003	PASSED
40	1880	-1.03	-0.0005	PASSED
30	1880	2.71	0.0014	PASSED
20	1880	8.01	0.0043	PASSED
10	1880	1.87	0.001	PASSED
0	1880	10.07	0.0054	PASSED
-10	1880	7.62	0.0041	PASSED
-20	1880	15.17	0.0081	PASSED
-30	1880	12.85	0.0068	PASSED

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

EUT with DUT number	RM-864, DUT 52846
Accessories with DUT numbers	SD-4MOD, DUT 52832
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22/70/100.7
Date of measurements	30-Aug-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 / 4.3	836.6	-3.1	-0.0037	PASSED
Nominal / 3.9	836.6	-6.01	-0.0072	PASSED
Battery cut-off point / 3.3	836.6	-4.97	-0.0059	PASSED

5.4. GSM 1900 Test results

GSM, Channel 661 / 1880.0 MHz

Voltage level [V]	Frequency [MHz]	Deviation [Hz]	Deviation [ppm]	Result
Max / 4.3	1880	3.16	0.0017	PASSED
Nominal / 3.9	1880	9.17	0.0049	PASSED
Battery cut-off point / 3.3	1880	7.17	0.0038	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	-