

FCC Part 22/24 Compliance Test Report

Test Report no.:	FCC22&24_RM-614_07.doc	Date of Report:	05-Mar-2010
Number of pages:	12	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		
FCC ID:	QTLRM-614	IC:	661AB-RM614
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 22 and 24, TIA-603-C-2004 and IC standards RSS-GEN (Issue 2, June 2007) and RSS-132 (Issue 2, September 2005) and 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:			

Jia Dongsheng, System Manager

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

Date of receipt	11-Feb-2010
Testing completed	20-Feb-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	FCC22&24_RM-614_07.doc

1.1. EUT and Accessory Information

The EUT is a 4-band (GSM850/900/1800/1900) mobile phone with GPRS, EGPRS and WLAN and Bluetooth. The EUT is tested with maximum rated TX power, modulated with pseudo random bit sequence (PRBS9).

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-614	008600080027757	0201	-	ag92_10w03	51593
Battery	BL-5J	4620409503I20270639;0670574	-	-	-	51595

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	PASSED
§2.1049(h)	4.6.1	99 % occupied bandwidth	NP
§22.917(a)	4.5	Band edge compliance	PASSED
§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	NP
§2.1055(d)	4.3	Frequency stability, voltage variation	NP

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	PASSED
§2.1049(h)	4.6.1	99 % occupied bandwidth	NP
§24.238(a)	6.5	Band edge compliance	PASSED
§24.238(a), §2.1051	6.5	Spurious emissions at antenna terminals	NP
§24.238(a), §2.1053	6.5	Spurious radiated emissions	NP
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	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 Laboratory.

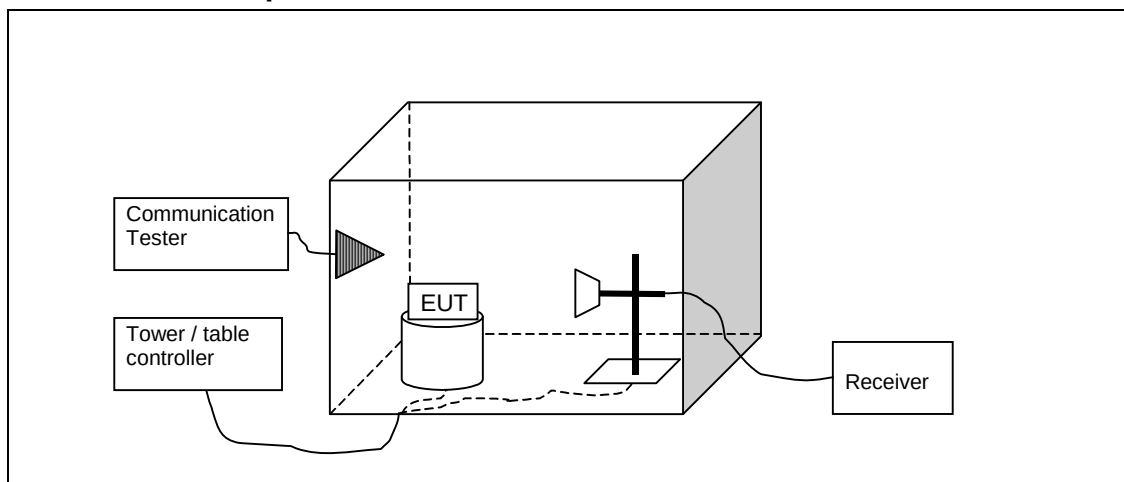
CONTENTS

1. Summary for FCC Part 22/24 Compliance Test Report	2
1.1. EUT and Accessory Information	2
1.2. Summary of Test Results	2
2. Radiated RF output power	
(FCC §22.913(a), §24.232(b), RSS-132 4.4, RSS-133 6.4)	4
2.1. Test Setup	4
2.2. Test method and limit	4
2.3. GSM850 TX Test results	6
2.4. GSM1900 TX Test results	6
3. Band edge compliance	
(FCC §22.917(a), 24.238(a), RSS-132 4.5, RSS-133 6.5).....	7
3.1. Test Setup	7
3.2. Test method and limit	7
3.3. GSM850 Test results	8
3.4. GSM1900 Test results	10
4. Test Equipment.....	12
4.1. Conducted measurements	12
4.2. Radiated measurements	12

2. Radiated RF output power (FCC §22.913(a), §24.232(b), RSS-132 4.4, RSS-133 6.4)

EUT with DUT number	RM-614, DUT 51593
Accessories with DUT numbers	BL-5J, DUT 51595
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	19 / 34 / 100.6
Date of measurements	20-Feb-2010
Measured by	Zou Ming

2.1. Test Setup



2.2. Test method and limit

The measurement is made according to TIA-603-C-2004 as follows:

The measurement is performed in the Anechoic Chamber with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system. The turntable is rotated 360 degrees and this is repeated for both horizontal and vertical receive antenna polarizations.

The EUT is placed on a nonconductive plate at 170 cm height.

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:

$$A_{SUBST} = P_{SUBST\ TX} - P_{SUBST\ RX} - L_{SUBST\ CABLES} + G_{SUBST\ TX\ ANT}$$

Where A_{SUBST} is the final substitution correction including receive antenna gain. $P_{SUBST\ TX}$ is signal generator level, $P_{SUBST\ RX}$ is receiver level, $L_{SUBST\ CABLES}$ is cable losses including both TX and RX cables and $G_{SUBST\ TX\ ANT}$ is substitution antenna gain.

The measurement results are obtained as described below:

$$P[dBm] = P_{MEAS} + A_{TOT}$$

Where P_{MEAS} is receiver reading in dBm and A_{TOT} is total correction factor including cable loss and substitution correction ($A_{TOT} = L_{CABLES} + A_{SUBST}$).

Limits for radiated RF output power measurements

Frequency range [MHz]	Limit [W]	Limit([dBm])
824 - 849	7	38.5
1850 - 1910	2	33

2.3. GSM850 TX Test results

GSM mode

Channel / f_c [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
128 / 824.2	30.43	1.104	-3.37	33.8	VERTICAL	PASSED
190 / 836.6	30.29	1.069	-2.78	33.07	HORIZONTAL	PASSED
251 / 848.8	30.26	1.062	-3.55	33.81	VERTICAL	PASSED

EGPRS mode, 1 TX Slot

Channel / f_c [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
128 / 824.2	27.14	0.518	-6.66	33.8	VERTICAL	PASSED
190 / 836.6	25.74	0.375	-7.33	33.07	HORIZONTAL	PASSED
251 / 848.8	27.20	0.525	-6.61	33.81	VERTICAL	PASSED

2.4. GSM1900 TX Test results

GSM mode

Channel / f_c [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
512 / 1850.2	30.28	1.067	-15.28	45.56	VERTICAL	PASSED
661 / 1880	30.35	1.084	-14.94	45.29	VERTICAL	PASSED
810 / 1909.8	29.89	0.975	-15.78	45.67	HORIZONTAL	PASSED

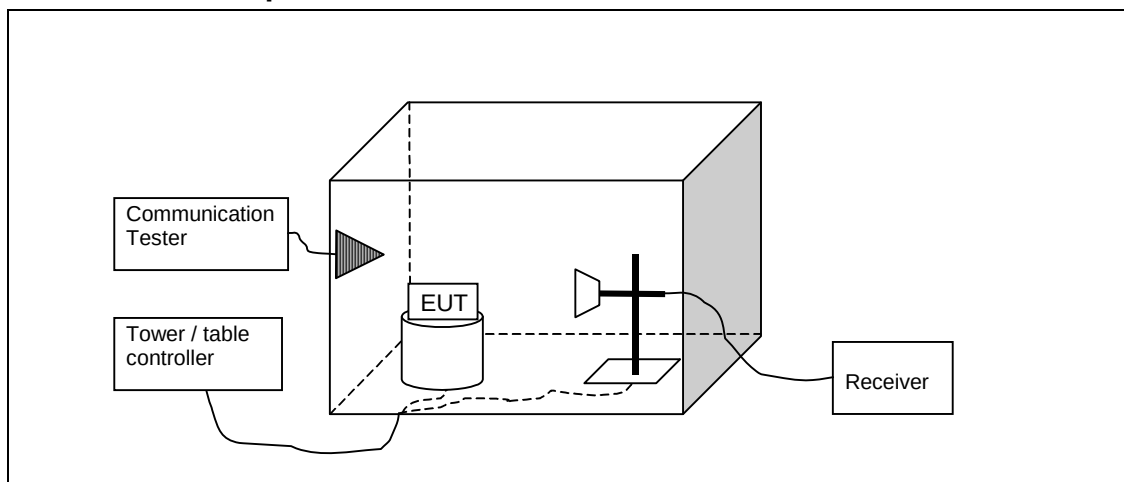
EGPRS mode, 1 TX Slot

Channel / f_c [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
512 / 1850.2	26.80	0.479	-18.76	45.56	VERTICAL	PASSED
661 / 1880	27.06	0.508	-18.23	45.29	VERTICAL	PASSED
810 / 1909.8	26.24	0.421	-19.43	45.67	HORIZONTAL	PASSED

3. Band edge compliance (FCC §22.917(a), 24.238(a), RSS-132 4.5, RSS-133 6.5)

EUT with DUT number	RM-614, DUT 51593
Accessories with DUT numbers	BL-5J, DUT 51595
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	19 / 34 / 100.6
Date of measurements	20-Feb-2010
Measured by	Zou Ming

3.1. Test Setup



3.2. Test method and limit

The measurement is made according to FCC rules parts 22 and 24 and IC standards RSS-132 and RSS-133.

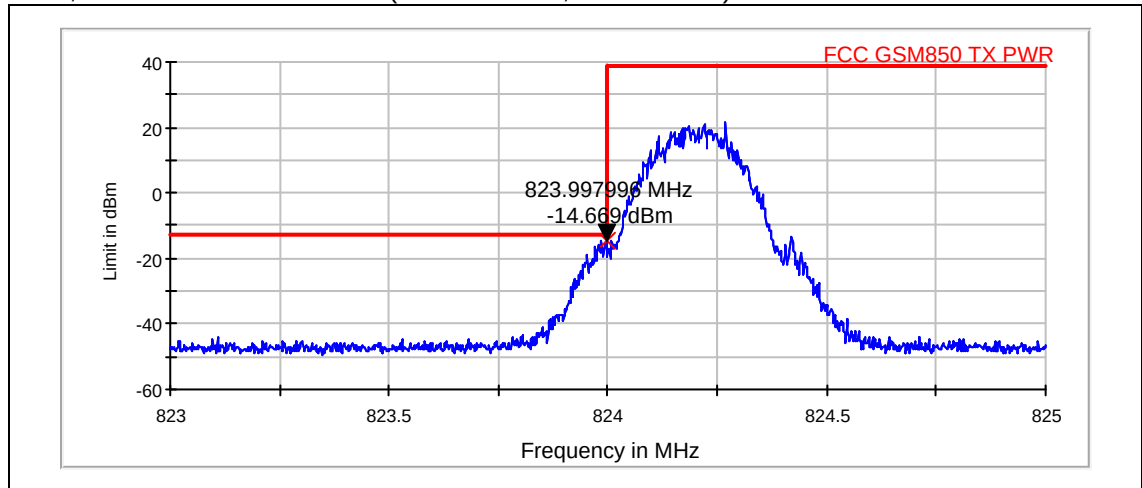
Limits for band edge compliance measurements

Operation band	Frequency range [MHz]	Limit [dBm]
GSM850	Below 824 and above 849	-13
GSM 1900 / WCDMA 1900	Below 1850 and above 1910	-13

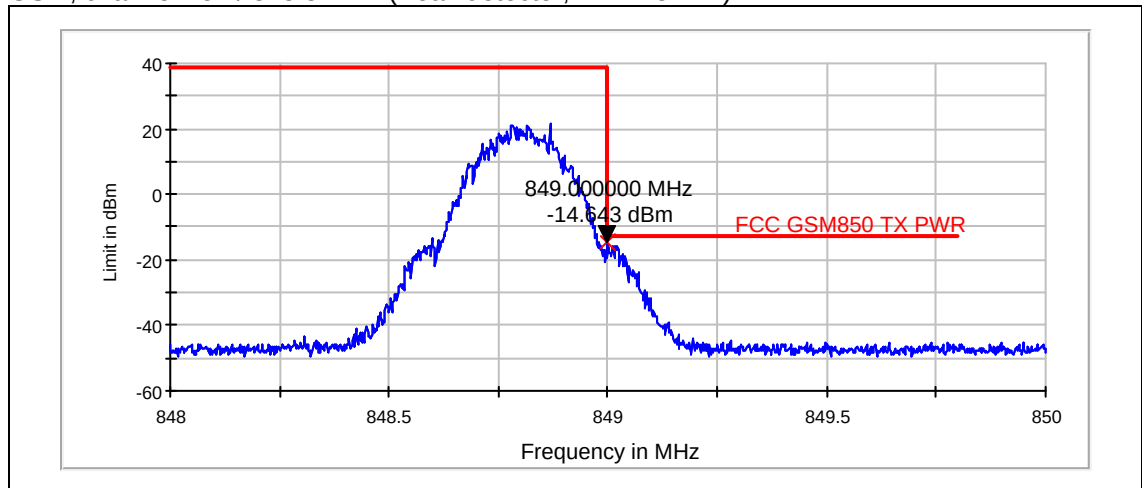
3.3. GSM850 Test results

Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]
GSM	128 / 824.2	-14.67
GSM	251 / 848.8	-14.64
EGPRS	128 / 824.2	-23.99
EGPRS	251 / 848.8	-18.46

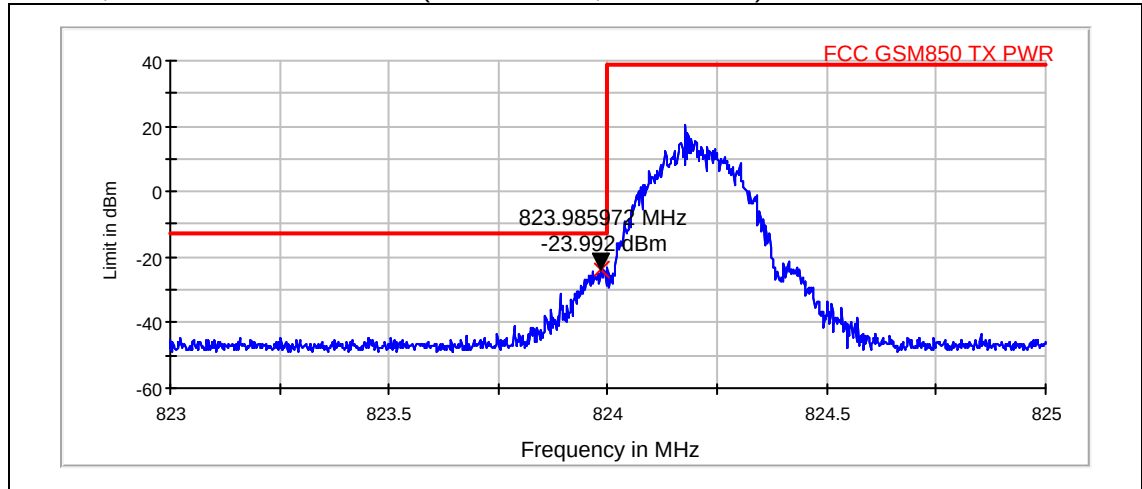
GSM, channel 128 / 824.2 MHz (Peak detector, RBW: 3 kHz)



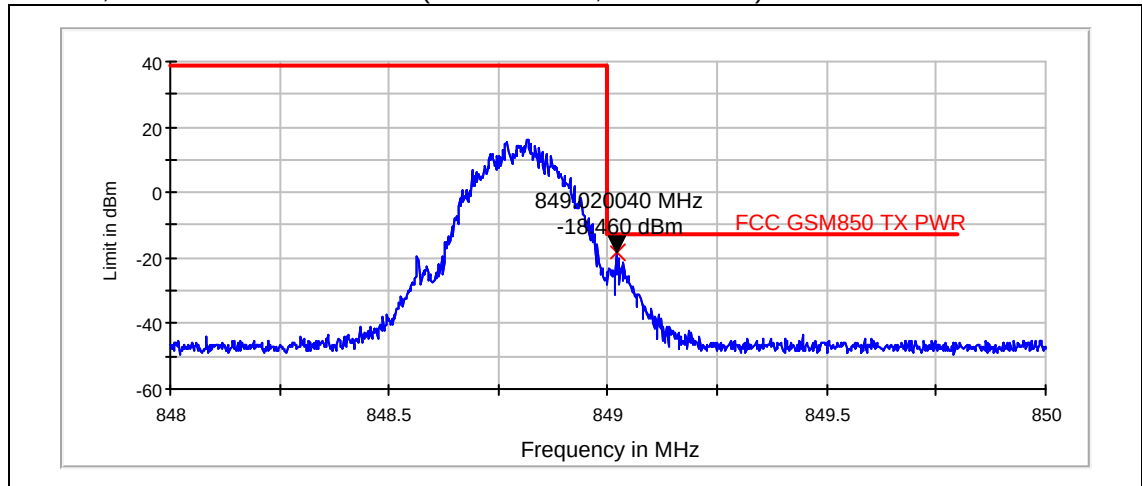
GSM, channel 251 / 848.8 MHz (Peak detector, RBW: 3 kHz)



EGPRS, channel 128 / 824.2 MHz (Peak detector, RBW: 3 kHz)



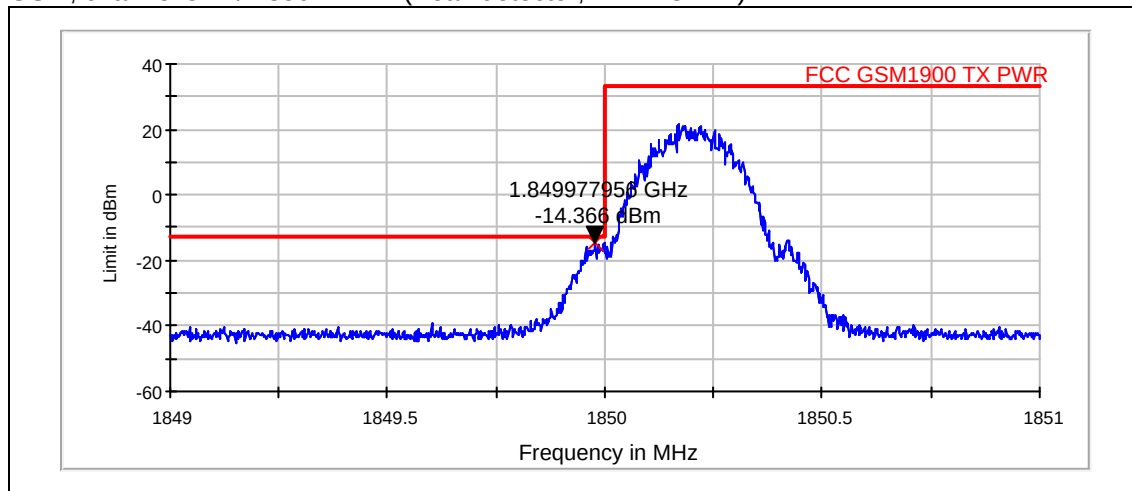
EGPRS, channel 251 / 848.8 MHz (Peak detector, RBW: 3 kHz)



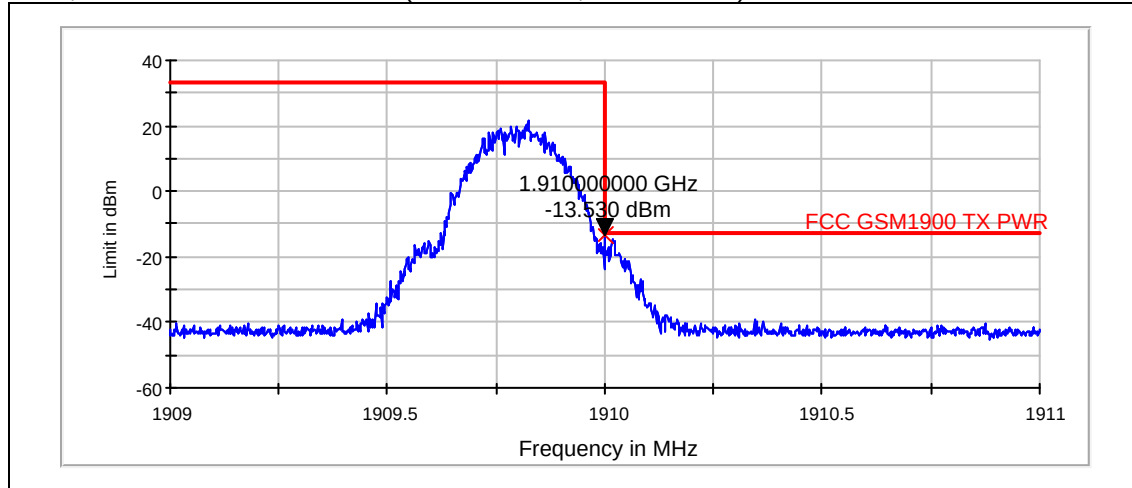
3.4. GSM1900 Test results

Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]
GSM	512 / 1850.2	-14.37
GSM	810 / 1909.8	-13.53
EGPRS	512 / 1850.2	-20.57
EGPRS	810 / 1909.8	-23.05

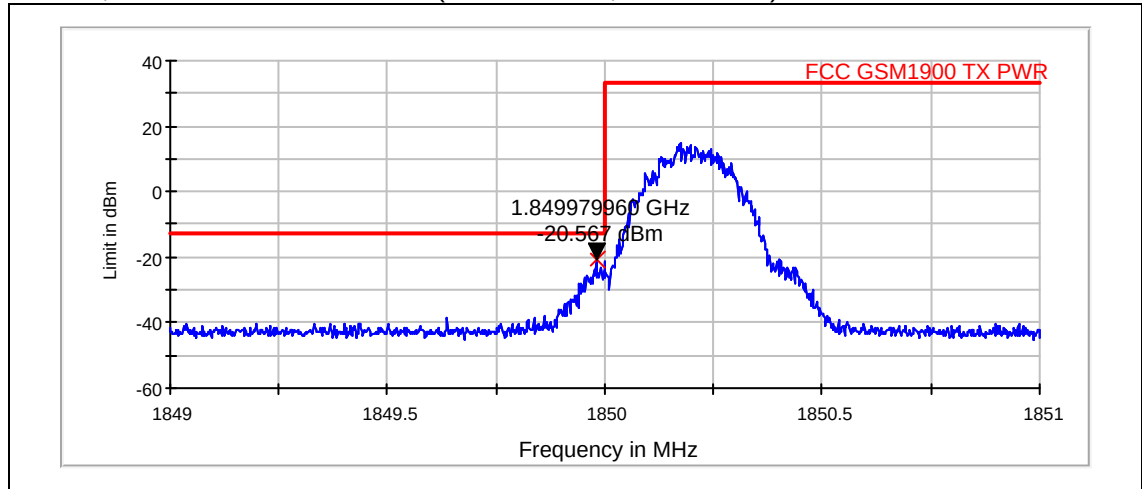
GSM, channel 512 / 1850.2 MHz (Peak detector, RBW: 3 kHz)



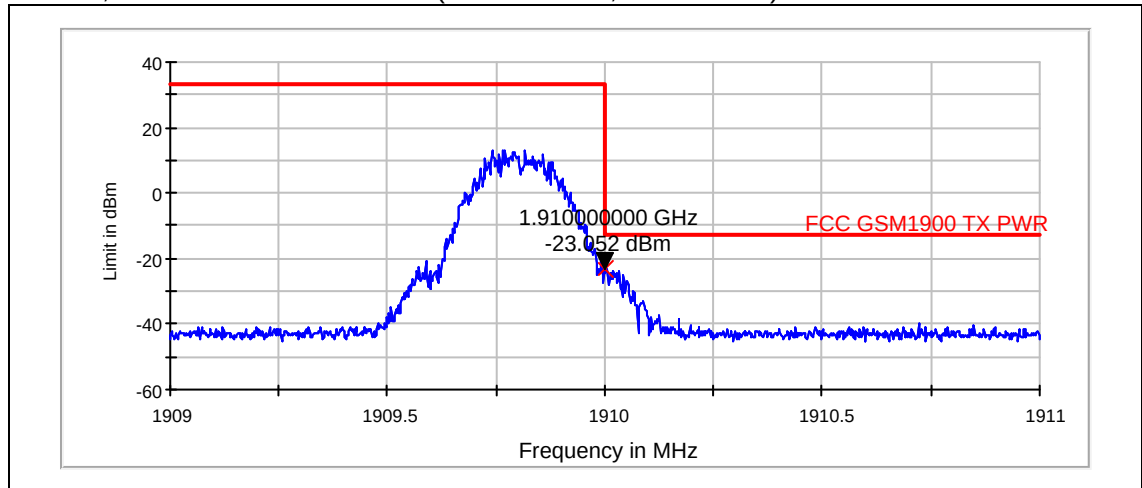
GSM, channel 810 / 1909.8 MHz (Peak detector, RBW: 3 kHz)



EGPRS, channel 512 / 1850.2 MHz (Peak detector, RBW: 3 kHz)



EGPRS, channel 810 / 1909.8 MHz (Peak detector, RBW: 3 kHz)



4. Test Equipment

4.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
BJPCHW002	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
BJPCPT0079	LISN 50 μ H	ESH3-Z5	R&S	15C,15B
BJPCPT0131	Communication Tester	CMU200	R&S	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	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

4.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	RF Emission Software	ES-K1 v.1.71	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-	Wainwright	24, 15B
BJPCPT0154	Band Reject Filter	WRCT2402/2480-	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-	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-	Wainwright	24, 15B
BJPCTC0065	Band Reject Filter	WRCG832/838-	Wainwright	27, 15B
BJPCTC0066	Antenna	SBA9113	Swarzbeck	22/24/27
BJPCTC0071	Multi-Device Controller	2090	EMCO	22/24/27, 15C, 15B
BJPCTC0072	Anechoic Chamber	3 m Semi / Full	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-	Miteq	22/24/27, 15C, 15B