

## FCC Part 22/24 Compliance Test Report

<b>Test Report no.:</b>	Bej_FCC_0752_03.doc	<b>Date of Report:</b>	30.12.2007
<b>Number of pages:</b>	14	<b>Customer's Contact person:</b>	Lehtinen Tero
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<b>FCC listing no.:</b>	884453		
<b>IC recognition no.:</b>	4917		
<b>Tested devices/ accessories:</b>	<b>Phone RM-426 / Battery BP-6MT, AC-charger AC-5E, Headset HS-47.</b>		
<b>FCC ID:</b>	PYARM-426	<b>IC:</b>	661V-RM426
<b>Supplement reports:</b>	-		
<b>Testing has been carried out in accordance with:</b>	CFR 47, FCC rules Parts 22 and 24, TIA-603-C-2004 and IC standards RSS-GEN (Issue 2, June 2007), RSS-132 (Issue 2, September 2005) and RSS-133 (Issue 3, June 2005). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".		
<b>Documentation:</b>	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.		
<b>Test Results:</b>	<b>The EUT complies with the requirements in respect of all parameters subject to the test.</b> The test results relate only to devices specified in this document.		
<b>Date and signature for the contents:</b>			

**Jia Dongsheng, Engineer**

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

Date of receipt	29.12.2007
Testing completed	30.12.2007
The customer's contact person	Lehtinen Tero
Test Plan referred to	T:\Projects\RM-426\TestPlan_RS\RS_Testplan_RM-426.xls
Notes	-
Document name	T:\Projects\RM-426\EMC\Results\FCC\Bej_FCC_0752_03.doc

### 1.1. EUT and Accessory Information

The EUT is a 6-band (GSM850/900/1800/1900 and WCDMA Band I/V(850)) mobile phone with GPRS, EGPRS, Bluetooth and WLAN. 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-426	004401012862302	0850	-	151.34.02	50786
Battery	BP-6MT	3932137173110100826;0670551	-	-	-	50787
AC-Charger	AC-5E	3943497311080605998;0675540	1.9	-	-	50765
Headset	HS-47	-	-	-	-	50788

### 1.2. Summary of Test Results

#### GSM 850:

Section in CFR 47	Section in RSS-GEN or RSS-132	Name of the test	Result
§2.1046(a), 22.913(a)	4.6, 4.4	Conducted RF output power	NP
§22.913(a)	4.6, 4.4	Radiated RF output power	PASSED
§2.1049(h)	4.4.1	99 % occupied bandwidth	NP
§22.917(a)	4.7, 4.5	Band edge compliance	PASSED
§22.917(a), §2.1051	4.7, 4.5	Spurious emissions at antenna terminals	NP
§22.917(a), §2.1053	4.7, 4.5	Spurious radiated emissions	NP
§2.1055(a)	4.5, 4.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.5, 4.3	Frequency stability, voltage variation	NP

#### GSM 1900:

Section in CFR 47	Section in RSS-133	Name of the test	Result
§2.1046(a)	6.2	Conducted RF output power	NP
§24.232(b)	6.2	Radiated RF output power	PASSED
§2.1049(h)	5.6	99 % occupied bandwidth	NP
§24.238(a)	6.3	Band edge compliance	PASSED
§24.238(a), §2.1051	6.3	Spurious emissions at antenna terminals	NP
§24.238(a), §2.1053	6.3	Spurious radiated emissions	NP
§2.1055(a)	7	Frequency stability, temperature variation	NP
§2.1055(d)	7	Frequency stability, voltage variation	NP

**WCDMA 850 (Band V):**

Section in CFR 47	Section in <i>RSS-GEN</i> or <i>RSS-132</i>	Name of the test	Result
§2.1046(a), 22.913(a)	4.6, 4.4	Conducted RF output power	NP
§22.913(a)	4.6, 4.4	Radiated RF output power	PASSED
§2.1049(h)	4.4.1	99 % occupied bandwidth	NP
§22.917(a)	4.7, 4.5	Band edge compliance	PASSED
§22.917(a), §2.1051	4.7, 4.5	Spurious emissions at antenna terminals	NP
§22.917(a), §2.1053	4.7, 4.5	Spurious radiated emissions	NP
§2.1055(a)	4.5, 4.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.5, 4.3	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 Beijing Laboratory.

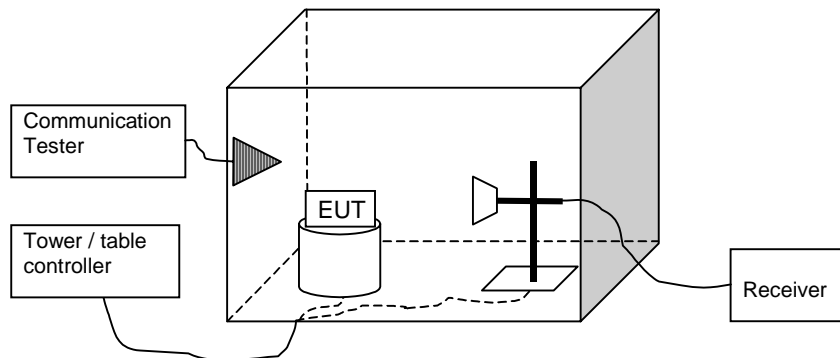
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**2. Radiated RF output power**  
(FCC §22.913(a), §24.232(b), RSS-GEN 4.6, RSS-132 4.4, RSS-133 6.2)

<b>EUT with DUT number</b>	RM-426, DUT50786
<b>Accessories with DUT numbers</b>	BP-6MT, DUT50787; AC-5E, DUT50765; HS-47, DUT50788
<b>Operation Voltage [V] / [Hz]</b>	220 / 50
<b>Result</b>	PASSED
<b>Remarks</b>	-
<b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b>	20 / 11 / 102
<b>Date of measurements</b>	30.12.2007
<b>Measured by</b>	Jia Dongsheng

**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. GSM 850 Test results

GSM mode

Channel / $f_c$ [MHz]	ERP [dBm]	ERP [W]	$P_{MEAS}$ [dBm]	$A_{TOT}$ [dB]	Polarisation	Result
128 / 824.2	21.50	0.141	-13.90	35.40	VERTICAL	PASSED
190 / 836.6	24.40	0.275	-11.10	35.50	HORIZONTAL	PASSED
251 / 848.8	26.30	0.427	-9.50	35.80	HORIZONTAL	PASSED

GPRS mode, 2 TX Slots

Channel / $f_c$ [MHz]	ERP [dBm]	ERP [W]	$P_{MEAS}$ [dBm]	$A_{TOT}$ [dB]	Polarisation	Result
128 / 824.2	20.00	0.100	-15.40	35.40	VERTICAL	PASSED
190 / 836.6	22.60	0.182	-12.90	35.50	HORIZONTAL	PASSED
251 / 848.8	24.40	0.275	-11.40	35.80	HORIZONTAL	PASSED

GPRS mode, 3 TX Slot

Channel / $f_c$ [MHz]	ERP [dBm]	ERP [W]	$P_{MEAS}$ [dBm]	$A_{TOT}$ [dB]	Polarisation	Result
128 / 824.2	17.70	0.059	-17.70	35.40	VERTICAL	PASSED
190 / 836.6	20.70	0.117	-14.80	35.50	HORIZONTAL	PASSED
251 / 848.8	22.50	0.178	-13.30	35.80	HORIZONTAL	PASSED

EGPRS mode, 2 TX Slot

Channel / $f_c$ [MHz]	ERP [dBm]	ERP [W]	$P_{MEAS}$ [dBm]	$A_{TOT}$ [dB]	Polarisation	Result
128 / 824.2	13.20	0.021	-22.20	35.40	VERTICAL	PASSED
190 / 836.6	16.20	0.042	-19.30	35.50	HORIZONTAL	PASSED
251 / 848.8	18.20	0.066	-17.60	35.80	HORIZONTAL	PASSED

EGPRS mode, 3 TX Slot

Channel / $f_c$ [MHz]	ERP [dBm]	ERP [W]	$P_{MEAS}$ [dBm]	$A_{TOT}$ [dB]	Polarisation	Result
128 / 824.2	13.40	0.022	-22.00	35.40	VERTICAL	PASSED
190 / 836.6	16.80	0.048	-18.70	35.50	HORIZONTAL	PASSED
251 / 848.8	18.40	0.069	-17.40	35.80	HORIZONTAL	PASSED

## 2.4. GSM 1900 Test results

### GSM mode

Channel / f <sub>C</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Result
512 / 1850.2	32.70	1.862	-16.30	49.00	HORIZONTAL	PASSED
661 / 1880.0	31.10	1.288	-15.50	46.60	HORIZONTAL	PASSED
810 / 1909.8	31.80	1.514	-16.60	48.40	HORIZONTAL	PASSED

### GPRS mode, 2 TX Slots

Channel / f <sub>C</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Result
512 / 1850.2	32.50	1.778	-16.50	49.00	HORIZONTAL	PASSED
661 / 1880.0	31.20	1.318	-15.40	46.60	HORIZONTAL	PASSED
810 / 1909.8	25.30	0.339	-23.10	48.40	HORIZONTAL	PASSED

### GPRS mode, 3 TX Slot

Channel / f <sub>C</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Result
512 / 1850.2	30.80	1.202	-18.20	49.00	HORIZONTAL	PASSED
661 / 1880.0	28.90	0.776	-17.70	46.60	HORIZONTAL	PASSED
810 / 1909.8	21.70	0.148	-26.70	48.40	HORIZONTAL	PASSED

### EGPRS mode, 2 TX Slot

Channel / f <sub>C</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Result
512 / 1850.2	28.90	0.776	-20.10	49.00	HORIZONTAL	PASSED
661 / 1880.0	27.10	0.513	-19.50	46.60	HORIZONTAL	PASSED
810 / 1909.8	21.90	0.155	-26.50	48.40	HORIZONTAL	PASSED

### EGPRS mode, 3 TX Slot

Channel / f <sub>C</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Result
512 / 1850.2	28.90	0.776	-20.10	49.00	HORIZONTAL	PASSED
661 / 1880.0	27.50	0.562	-19.10	46.60	HORIZONTAL	PASSED
810 / 1909.8	19.90	0.098	-28.50	48.40	HORIZONTAL	PASSED

## 2.5. WCDMA 850 Test results

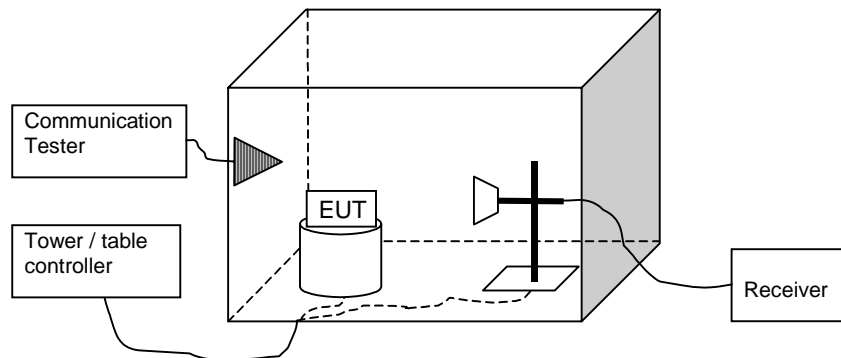
Channel / f <sub>C</sub> [MHz]	ERP [dBm]	ERP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Result
4132 / 826.4	11.90	0.015	-22.80	34.70	VERTICAL	PASSED
4175 / 835.0	16.90	0.049	-19.10	36.00	HORIZONTAL	PASSED
4233 / 846.6	17.70	0.059	-18.30	36.00	HORIZONTAL	PASSED

### 3. Band edge compliance

(FCC §22.917(a), 24.238(a), RSS-GEN 4.7, RSS-132 4.5, RSS-133 6.3)

<b>EUT with DUT number</b>	RM-426, DUT50786
<b>Accessories with DUT numbers</b>	BP-6MT, DUT50787; AC-5E, DUT50765; HS-47, DUT50788
<b>Operation Voltage [V] / [Hz]</b>	220 / 50
<b>Result</b>	PASSED
<b>Remarks</b>	-
<b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b>	20 / 11 / 102
<b>Date of measurements</b>	30.12.2007
<b>Measured by</b>	Jia Dongsheng

#### 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-GEN, RSS-132 and RSS-133.

Limits for band edge compliance measurements

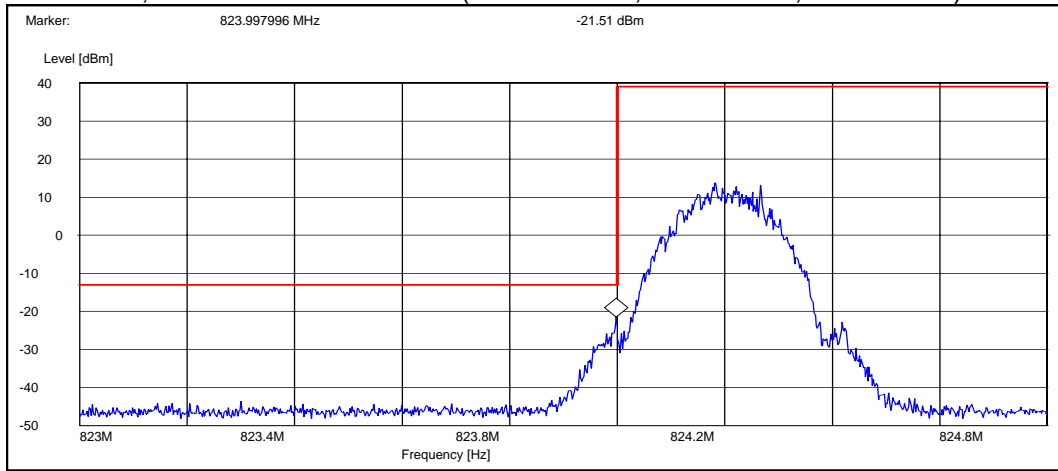
Operation band	Frequency range [MHz]	Limit [dBm]
GSM 850 / WCDMA 850	Below 824 and above 849	-13
GSM 1900	Below 1850 and above 1910	-13



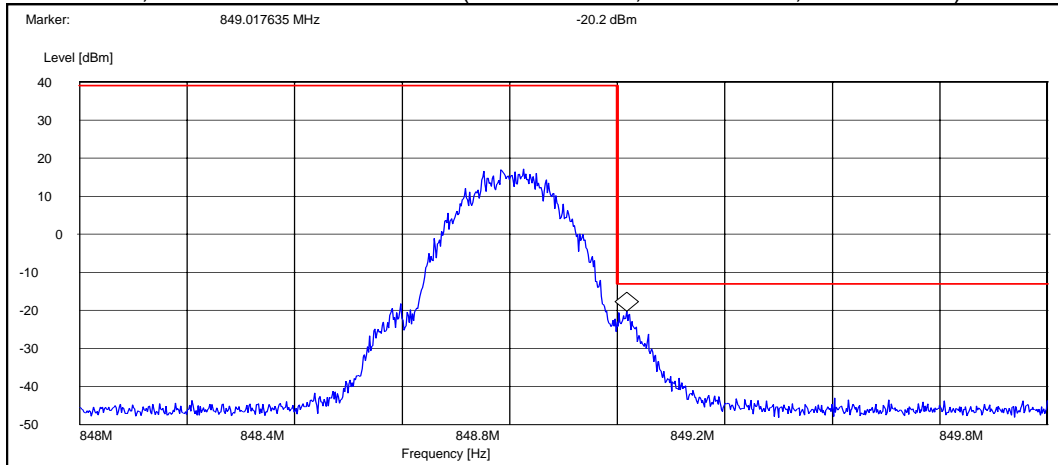
### 3.3. GSM 850 Test results

Operation mode (TX on)	Channel / $f_c$ [MHz]	Level [dBm]
GSM	128 / 824.2	-21.51
GSM	251 / 848.8	-20.20
EGPRS	128 / 824.2	-35.74
EGPRS	251 / 848.8	-34.15

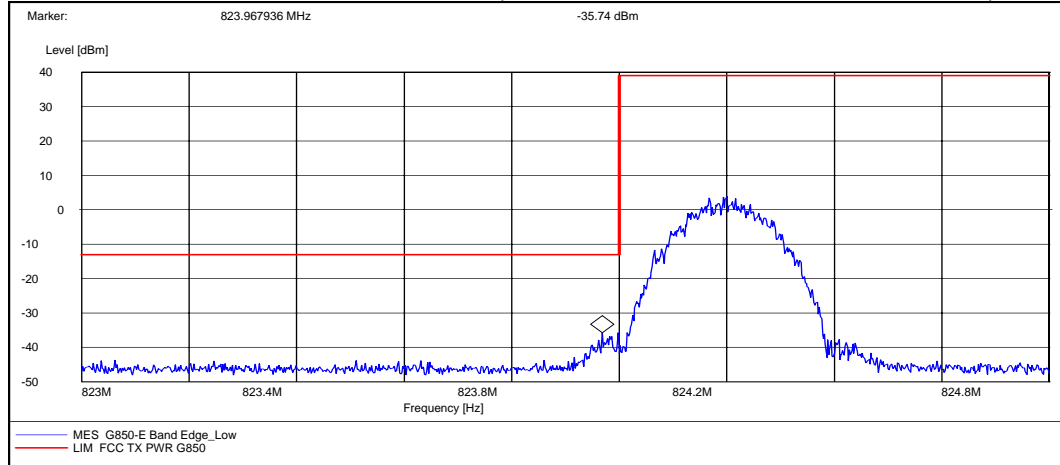
GSM mode, channel 128 / 824.2 MHz (Peak detector, RBW: 3 kHz, VBW: 3 kHz)



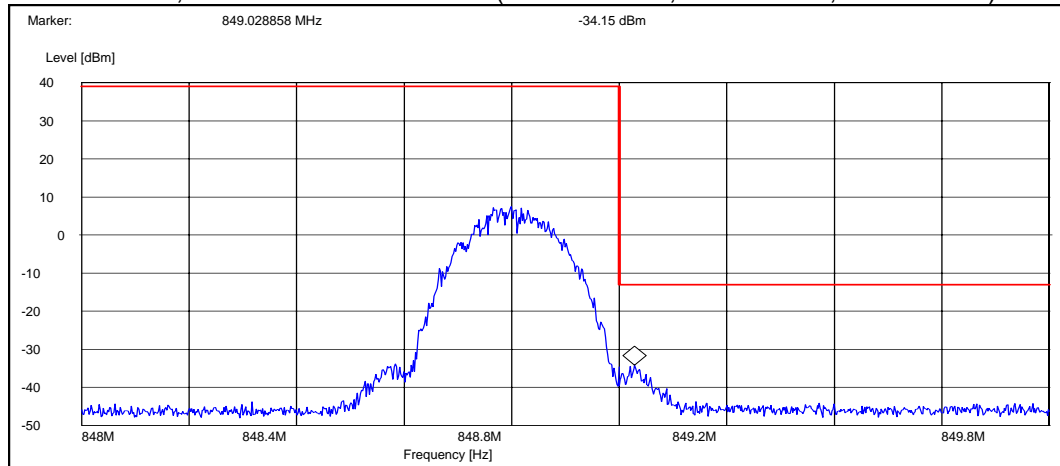
GSM mode, channel 251 / 848.8 MHz (Peak detector, RBW: 3 kHz, VBW: 3 kHz)



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



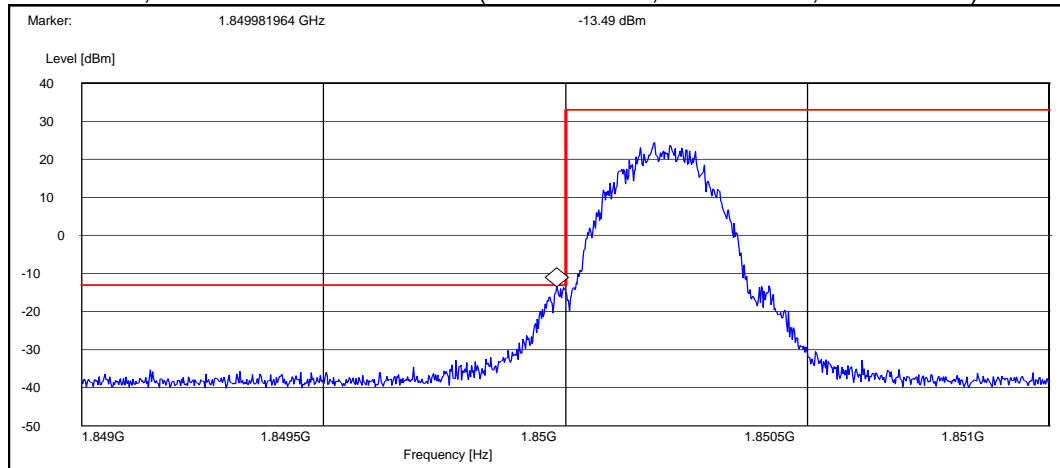
EGPRS mode, channel 251 / 848.8 MHz (Peak detector, RBW: 3 kHz, VBW: 3 kHz)



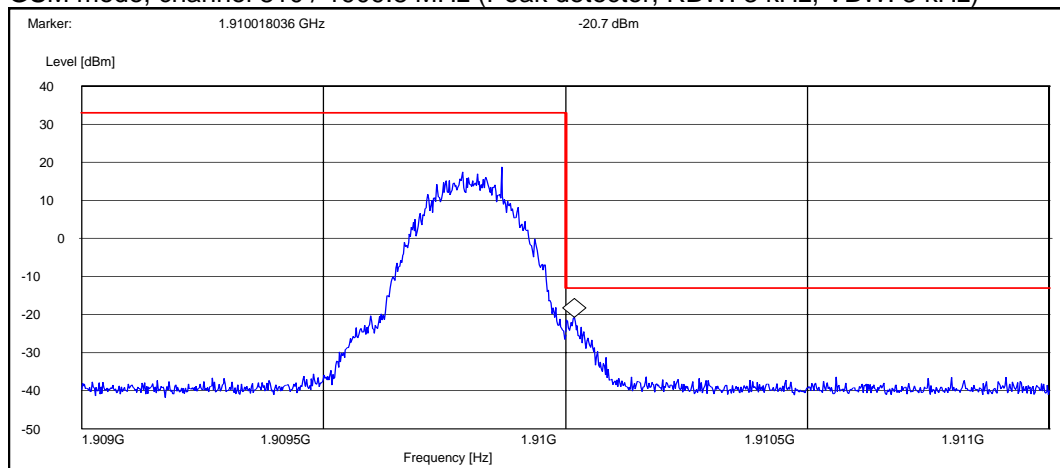
### 3.4. GSM 1900 Test results

Operation mode (TX on)	Channel / $f_c$ [MHz]	Level [dBm]
GSM	512 / 1850.2	-13.49
GSM	810 / 1909.8	-20.07
EGPRS	512 / 1850.2	-23.05
EGPRS	810 / 1909.8	-30.58

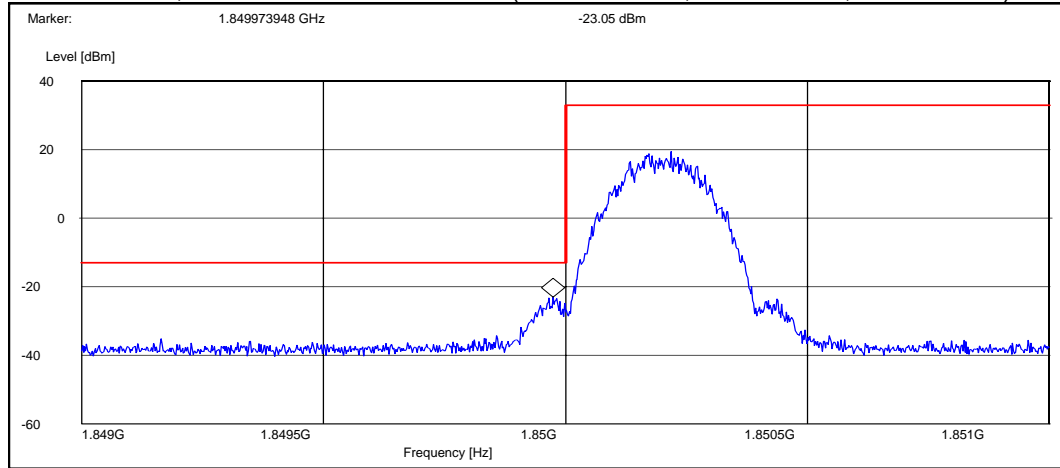
GSM mode, channel 512 / 1850.2 MHz (Peak detector, RBW: 3 kHz, VBW: 3 kHz)



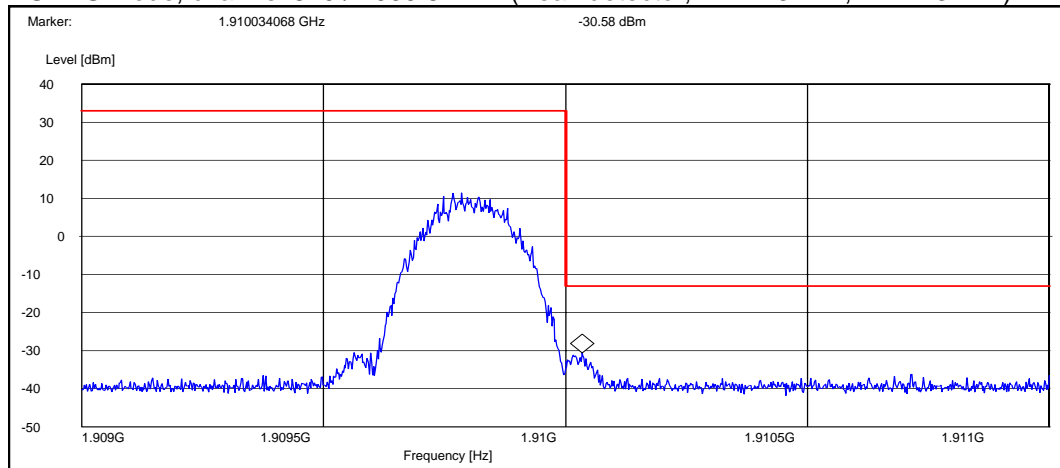
GSM mode, channel 810 / 1909.8 MHz (Peak detector, RBW: 3 kHz, VBW: 3 kHz)



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



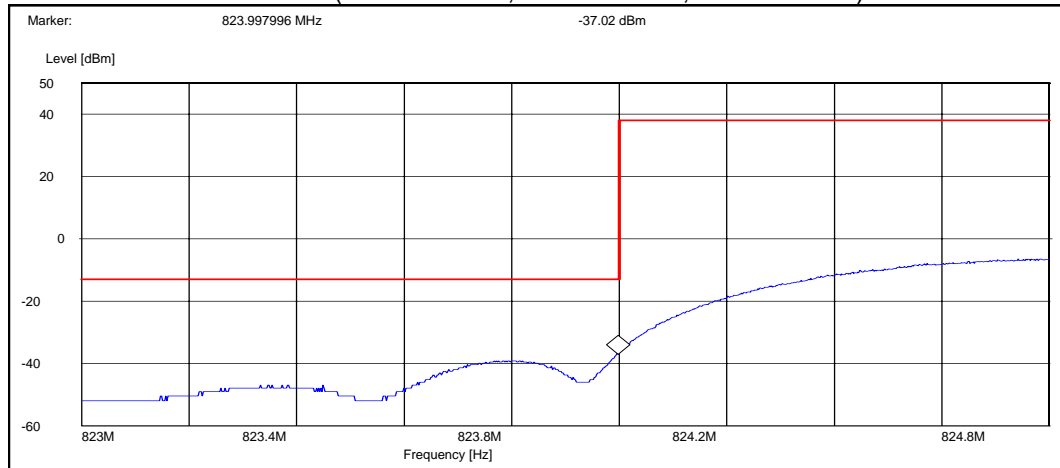
EGPRS mode, channel 810 / 1909.8 MHz (Peak detector, RBW: 3 kHz, VBW: 3 kHz)



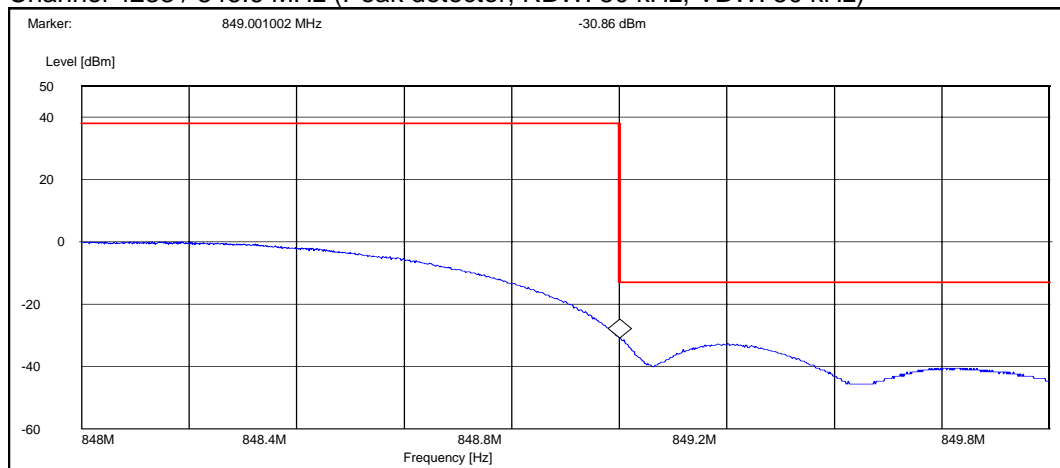
### 3.5. WCDMA 850 Test results

Operation mode (TX on)	Channel / $f_c$ [MHz]	Level [dBm]
FDD	4132 / 826.4	-37.02
FDD	4233 / 846.6	-30.86

Channel 4132 / 826.4 MHz (Peak detector, RBW: 50 kHz, VBW: 50 kHz)



Channel 4233 / 846.6 MHz (Peak detector, RBW: 50 kHz, VBW: 50 kHz)



## 4. Test Equipment

### 4.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
BJPCPT0039	LISN	ESH3-Z5	BJPCPT0039	15C, 15B
BJPCPT0040	TEST RECEIVER	ESCS30	BJPCPT0040	15C, 15B
BJPCPT0069	LISN	ESH3-Z5	BJPCPT0069	15C, 15B
BJPCPT0079	LISN	ESH3-Z5	BJPCPT0079	15C, 15B
BJPCPT0191	PULSE LIMITER	ESH3-Z2	BJPCPT0191	15C, 15B

### 4.2. 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 Pre-amplifier 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 pre-amplifier 3GHz-18GHz	BLMA-0118-1A-BT	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCTC0046	Shielding Enclosure	3M Test Site	ETS-Lindgren	22/24/27, 15C, 15B
BJPCTC0047	Turntable	Model 2088-1.23	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