

FCC Part 22 Compliance Test Report

Test Report no.:	FCC22_RM-553_01.doc	Date of Report:	18-Aug-2009
Number of pages:	14	Customer's Contact person:	Futoshi Kimura
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FCC listing no.:	975940		
IC recognition no.:	661AH-1		
Tested devices/ accessories:	Phone RM-553 / Battery BL-4D, AC-charger AC-10E, Headset WH-701.		
FCC ID:	QTLRM-553	IC:	661AB-RM553
Supplement reports:			
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 22, TIA-603-C-2004 and IC standards RSS-GEN (Issue 2, June 2007) and RSS-132 (Issue 2, September 2005). 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 Compliance Test Report

Date of receipt	16-Aug-2009
Testing completed	18-Aug-2009
The customer's contact person	Futoshi Kimura
Test Plan referred to	T:\Projects\RM-553\TestPlan_RS\RS_testplan_RM-553.xls
Notes	-
Document name	FCC22_RM-553_01.doc

1.1. EUT and Accessory Information

The EUT is a 7-band (GSM850/900/1800/1900 and WCDMA Band I/II(1900)/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-553	004401108144359	4005	-	V 52.50.2009.31.1	51397
Battery	BL-4D	4181579161001101130;0670603	-	-	-	51398
AC-charger	AC-10E	3997918367090504571;0675408	-	-	-	51285
Headset	WH-701	06944289233H2R01619	4.0	4.0	4.0	51400

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)	4.4	Conducted RF output power	NP
§22.913(a)	4.4	Radiated RF output power	NP
§2.1049(h)	4.6.1	99 % occupied bandwidth	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	PASSED
§2.1055(a)	4.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.3	Frequency stability, voltage variation	NP

WCDMA 850 (Band V):

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	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	PASSED
§2.1055(a)	4.3	Frequency stability, temperature variation	NP
§2.1055(d)	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.

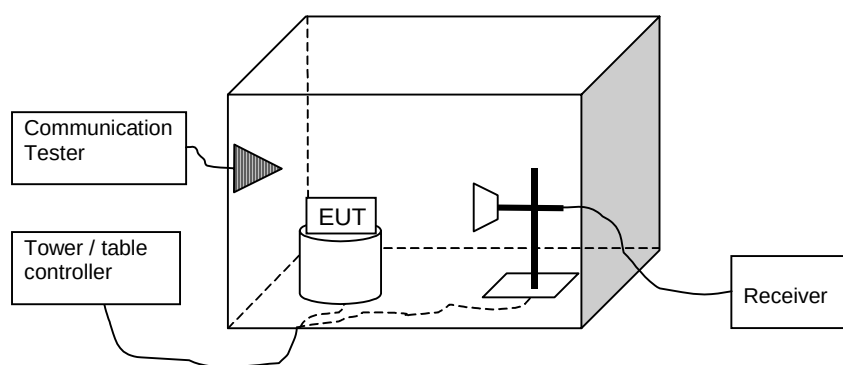
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2. Band edge compliance (FCC §22.917(a), RSS-132 4.5)

EUT with DUT number	RM-553, DUT51397
Accessories with DUT numbers	BL-4D, DUT51398;AC-10E, DUT51285;WH-701, DUT51400
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	Test was done in slide open and close.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 68 / 100
Date of measurements	18-Aug-2009
Measured by	Zou Ming

2.1. Test setup



2.2. Test method and limit

The measurement is made according to FCC rules part 22 and IC standard RSS-132.

Limits for band edge compliance measurements

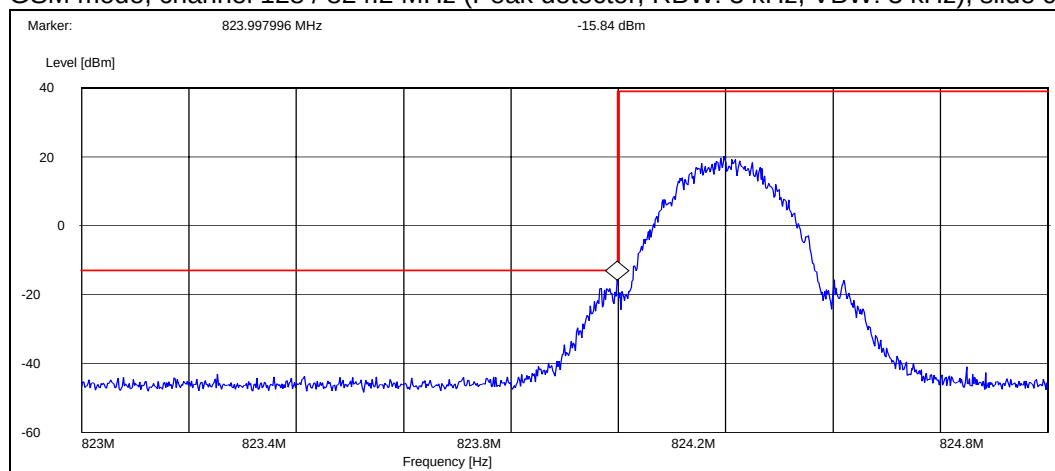
Operation band	Frequency range [MHz]	Limit [dBm]
GSM 850 / WCDMA 850	Below 824 and above 849	-13

2.3. GSM 850 Test results

Slide closed

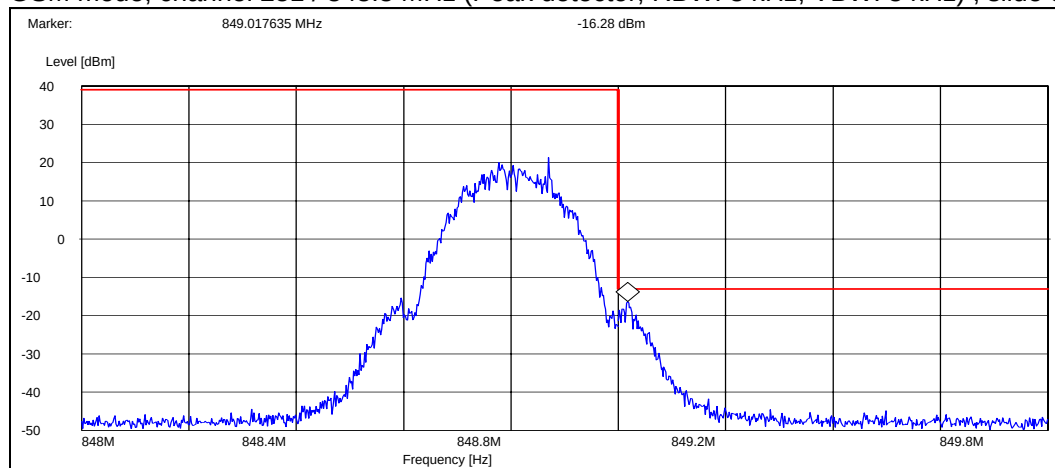
Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]
GSM	128 / 824.2	-15.80
GSM	251 / 848.8	-16.30
EGPRS	128 / 824.2	-31.60
EGPRS	251 / 848.8	-31.20

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



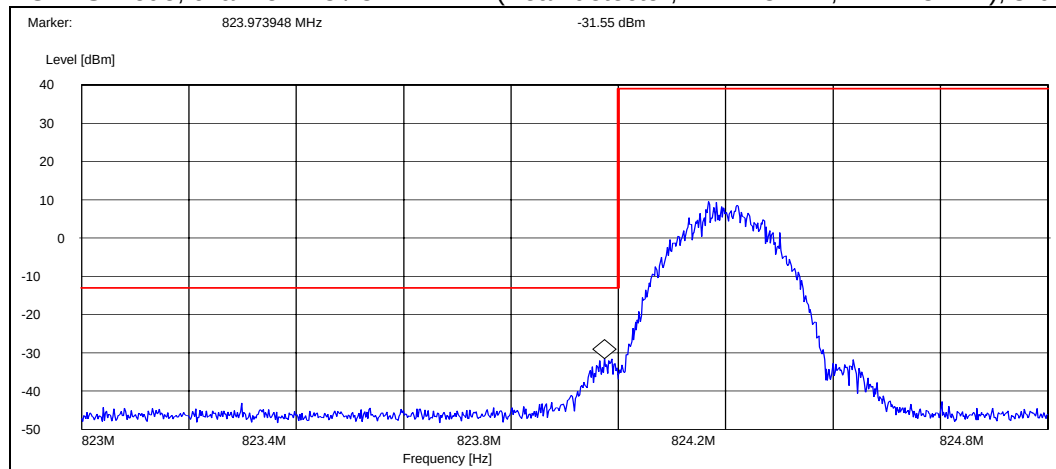
Operation mode (TX on)	Channel / f_c [MHz]	P [dBm]
GSM	128 / 824.2	-15.80

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



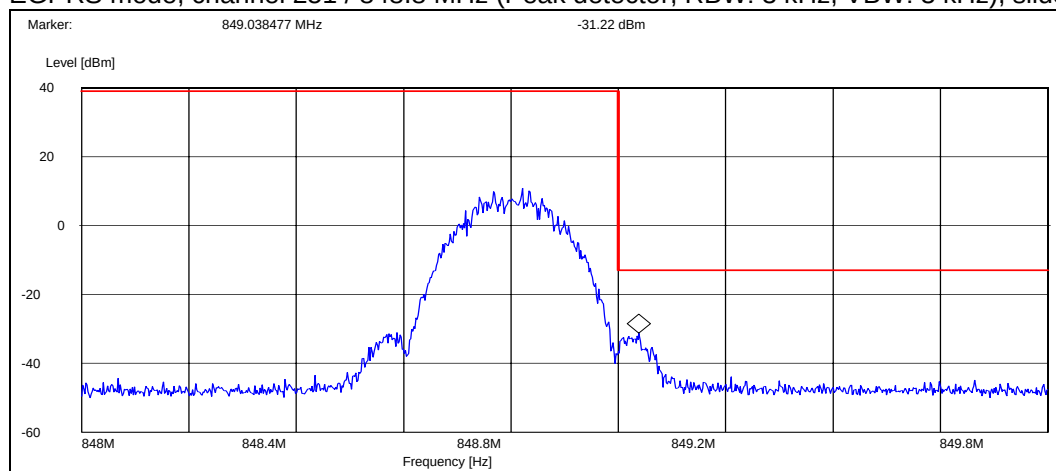
Operation mode (TX on)	Channel / f_c [MHz]	P [dBm]
GSM	251 / 848.8	-16.30

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



Operation mode (TX on)	Channel / f_c [MHz]	P [dBm]
EGPRS	128 / 824.2	-31.60

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

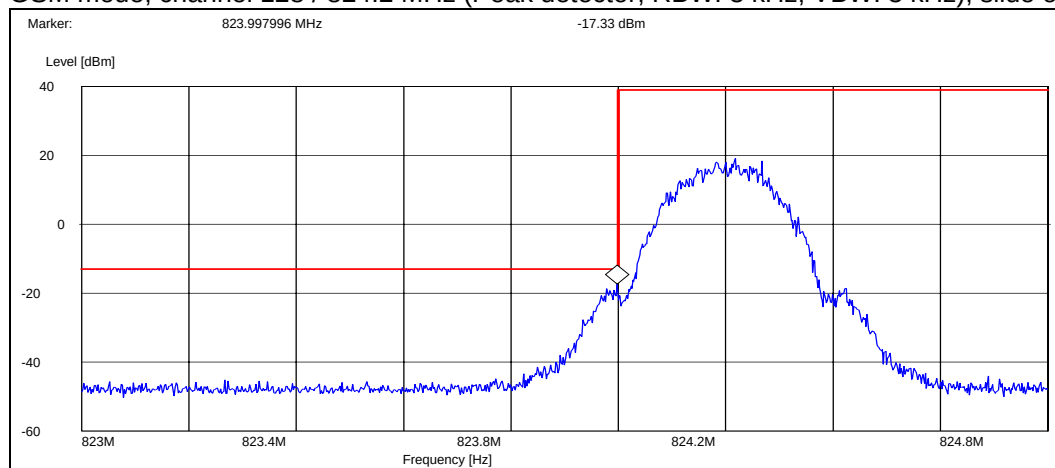


Operation mode (TX on)	Channel / f_c [MHz]	P [dBm]
EGPRS	251 / 848.8	-31.20

Slide open

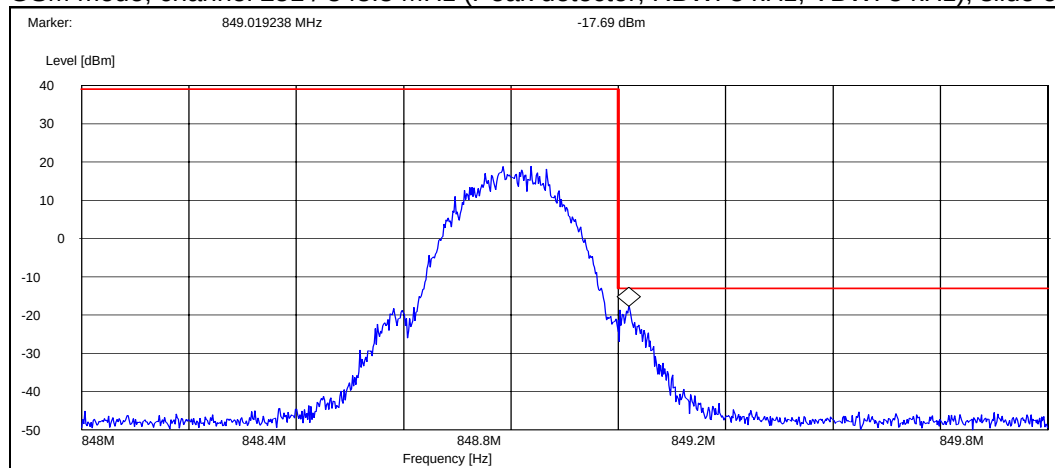
Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]
GSM	128 / 824.2	-17.30
GSM	251 / 848.8	-17.70
EGPRS	128 / 824.2	-33.80
EGPRS	251 / 848.8	-31.20

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



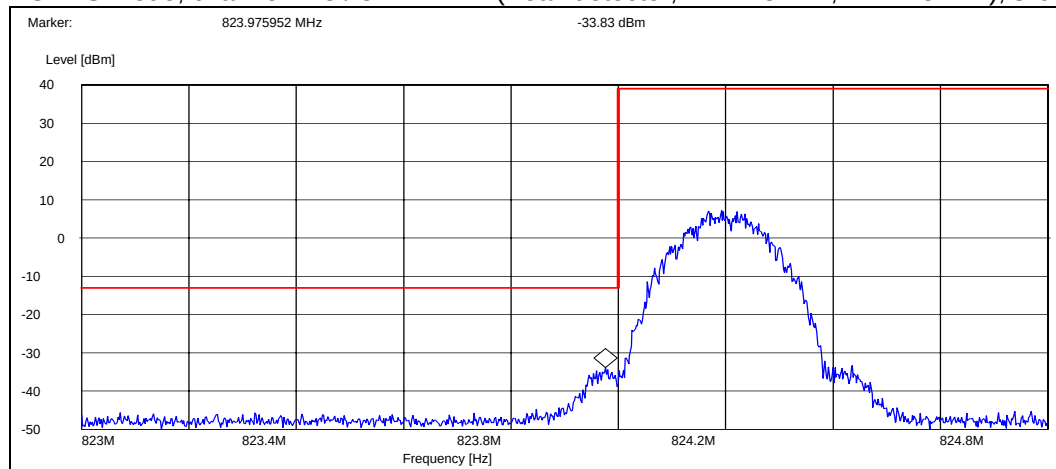
Operation mode (TX on)	Channel / f_c [MHz]	P [dBm]
GSM	128 / 824.2	-17.30

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



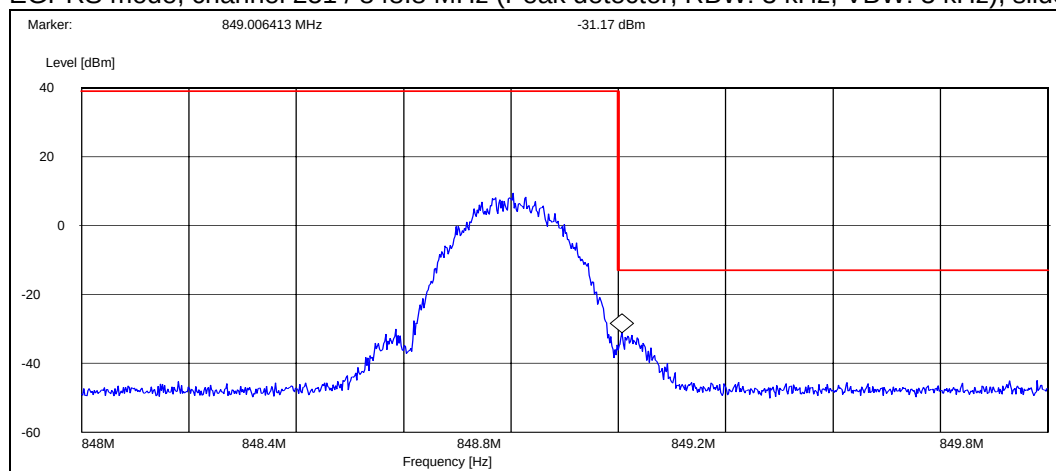
Operation mode (TX on)	Channel / f_c [MHz]	P [dBm]
GSM	251 / 848.8	-17.70

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



Operation mode (TX on)	Channel / f_c [MHz]	P [dBm]
EGPRS	128 / 824.2	-33.80

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



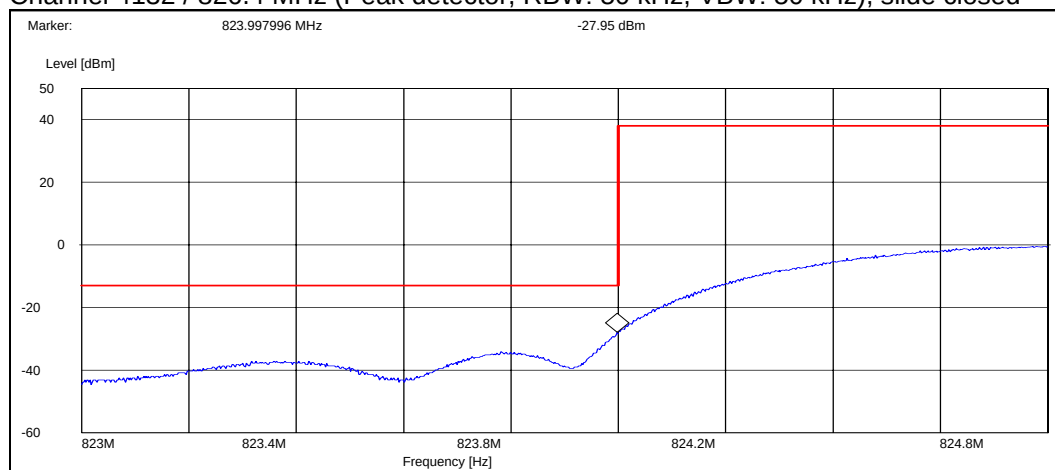
Operation mode (TX on)	Channel / f_c [MHz]	P [dBm]
EGPRS	251 / 848.8	-31.20

2.4. WCDMA 850 Test results

Slide closed

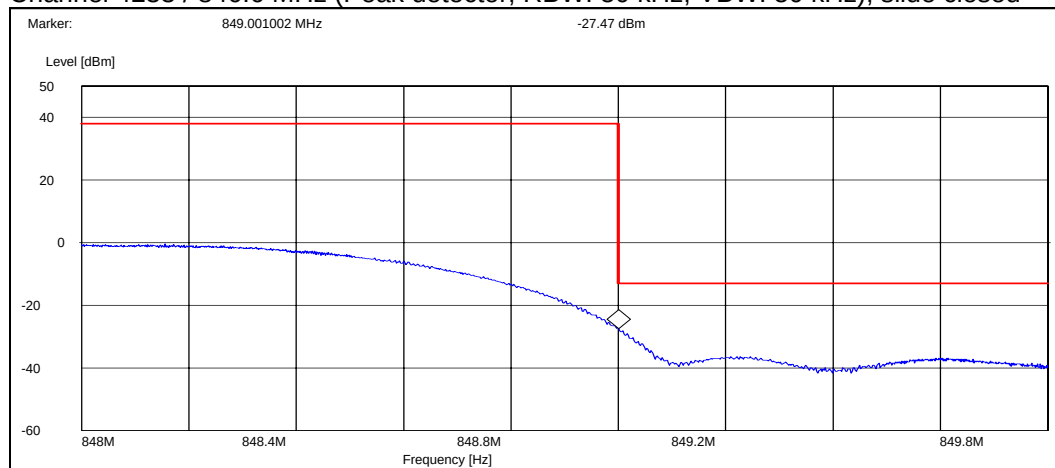
Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]
FDD	4132 / 826.4	-28.00
FDD	4233 / 846.6	-27.50

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



Operation mode (TX on)	Channel / f_c [MHz]	P [dBm]
FDD	4132 / 826.4	-28.00

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

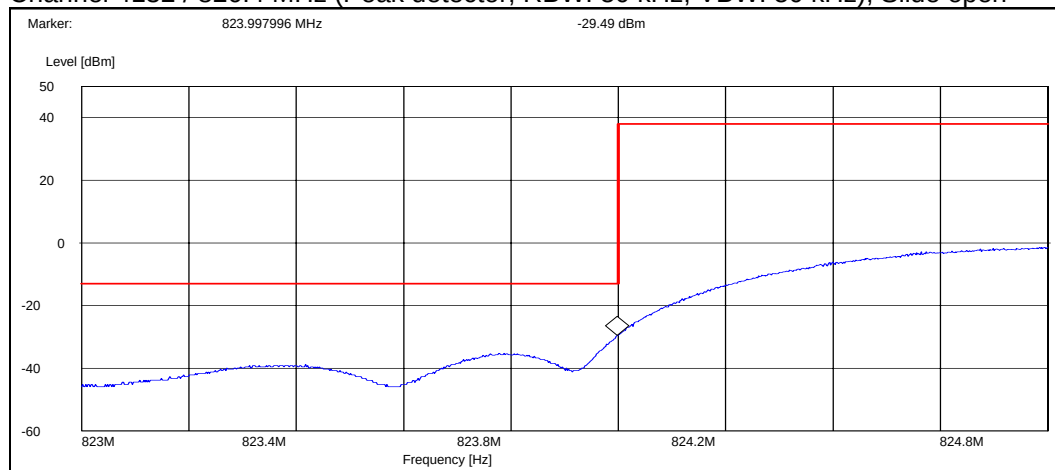


Operation mode (TX on)	Channel / f_c [MHz]	P [dBm]
FDD	4233 / 846.6	-27.50

Slide open

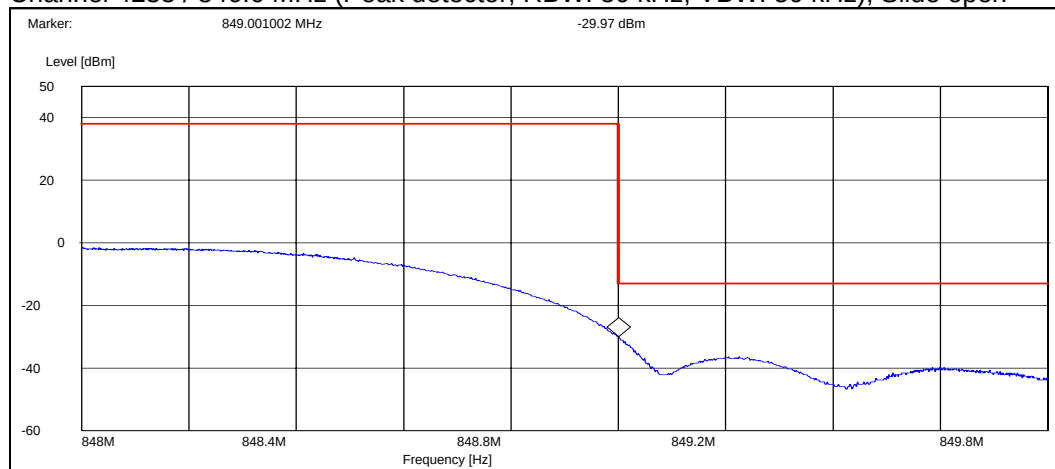
Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]
FDD	4132 / 826.4	-29.50
FDD	4233 / 846.6	-30.00

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



Operation mode (TX on)	Channel / f_c [MHz]	P [dBm]
FDD	4132 / 826.4	-29.50

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

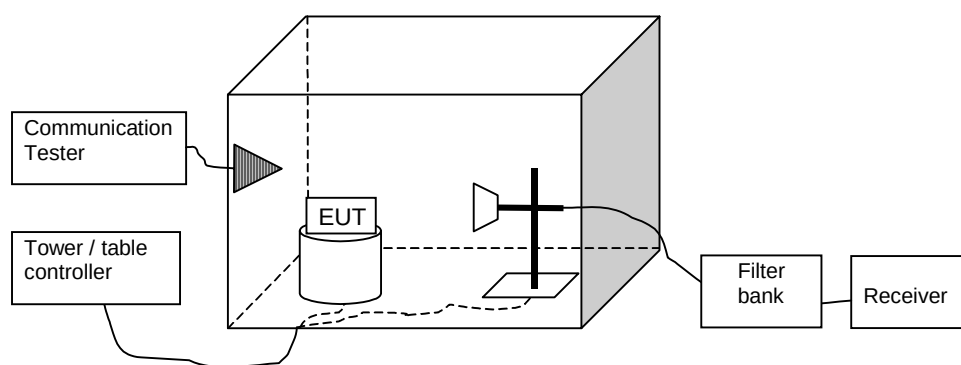


Operation mode (TX on)	Channel / f_c [MHz]	P [dBm]
FDD	4233 / 846.6	-30.00

3. Spurious radiated emissions (FCC §22.917(a), §2.1053, RSS-132 4.5)

EUT with DUT number	RM-553, DUT51397
Accessories with DUT numbers	BL-4D, DUT51398;AC-10E, DUT51285;WH-701, DUT51400
Operation Voltage [V] / [Hz]	Nominal
Result	PASSED
Remarks	Test was done in slide open and close.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 68 / 100
Date of measurements	18-Aug-2009
Measured by	Zou Ming

3.1. 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 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 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, preamplifier gain and substitution correction ($A_{TOT} = L_{CABLES} - G_{PREAMP} + A_{SUBST}$).

Limits for spurious radiated emissions measurements

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

3.3. GSM 850 Test results

Slide closed

GSM mode, channel 190 / 836.6 MHz

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
1673.348697	-49.90	0.01023	-55.30	5.40	HORIZONTAL	PASSED
2519.436874	-52.50	0.00562	-64.70	12.20	VERTICAL	PASSED
3347.197395	-53.10	0.00490	-62.00	8.90	VERTICAL	PASSED

EGPRS mode, channel 190 / 836.6 MHz

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
1673.348697	-56.40	0.00229	-61.80	5.40	HORIZONTAL	PASSED
2516.936874	-52.70	0.00537	-64.90	12.20	VERTICAL	PASSED
3345.197395	-55.20	0.00302	-64.20	9.00	VERTICAL	PASSED

Slide open

GSM mode, channel 190 / 836.6 MHz

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
1672.937876	-51.80	0.00661	-57.20	5.40	HORIZONTAL	PASSED
2509.820641	-45.80	0.02630	-57.90	12.10	VERTICAL	PASSED

EGPRS mode, channel 190 / 836.6 MHz

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
1672.937876	-52.10	0.00617	-57.50	5.40	HORIZONTAL	PASSED
2509.820641	-52.70	0.00537	-64.80	12.10	VERTICAL	PASSED

3.4. WCDMA 850 Test results

Slide closed

Channel 4175 / 835.0 MHz

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
2507.320641	-51.80	0.00661	-63.90	12.10	VERTICAL	PASSED

Slide open

Channel 4175 / 835.0 MHz

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
1669.937876	-58.00	0.00158	-63.50	5.50	HORIZONTAL	PASSED

4. Test Equipment

4.1. 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

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 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