

FCC Part 22/24 Compliance Test Report

Test Report no.:	Bej_FCC_0801_02.doc	Date of Report:	08.01.2008
Number of pages:	15	Customer's Contact person:	Helen Hu
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FCC listing no.:	884453		
IC recognition no.:	4917		
Tested devices/ accessories:	Phone RM-259 / Battery BL-4B, Headset HS-47, AC-charger AC-3		
FCC ID:	QTLRM-259	IC:	661AB-RM259
Supplement reports:	-		
Testing has been carried out in accordance with:	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".		
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:			

Yin Hongpeng, Engineer

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

Date of receipt	02.01.2008
Testing completed	07.01.2008
The customer's contact person	Helen Hu
Test Plan referred to	T:\Projects\RM-259\TestPlan_RS\RS_Testplan_RM-259_CR_CR16_engine_board_change_from_2CP_50_to_2CP_51.xls
Notes	-
Document name	T:\Projects\RM-259\EMC\Results\FCC\Bej_FCC_0801_02.doc

1.1. EUT and Accessory Information

The EUT is a 2-band (GSM850/1900) mobile phone with GPRS 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-259	001004/00/262060/8	9505	-	V 04.22	50790
Battery	BL-4B	0670501382066N513A10100157	-	-	-	50575
Headset	HS-47	0694579651502105972	-	-	-	50727
AC-charger	AC-3	3997916506292100005;0675370	-	-	-	50578

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	PASSED
§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	PASSED
§2.1055(a)	7	Frequency stability, temperature variation	NP
§2.1055(d)	7	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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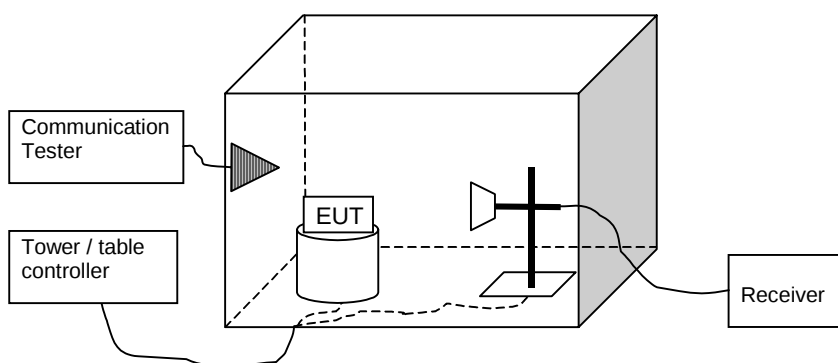
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2. Radiated RF output power

(FCC §22.913(a), §24.232(b), §27.50(d)(2), RSS-GEN 4.6, RSS-132 4.4, RSS-133 6.2)

EUT with DUT number	RM-259 DUT50790
Accessories with DUT numbers	BL-4B DUT50575; AC-3 DUT50578; HS-47 DUT50727
Operation Voltage [V] / [Hz]	220 / 50
Result	PASSED
Remarks	Test was done with flip open and closed
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20.6 / 9.5 / 101.9 – 20 / 15 / 101.7
Date of measurements	03 – 07.01.2008
Measured by	Zou Ming, Yin Hongpeng

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

Phone opened

GSM mode

Channel / f_c [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
128 / 824.2	29.50	0.891	-5.60	35.10	HORIZONTAL	PASSED
190 / 836.6	30.60	1.148	-4.90	35.50	HORIZONTAL	PASSED
251 / 848.8	30.80	1.202	-5.00	35.80	HORIZONTAL	PASSED

GPRS 2-slots

Channel / f_c [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
128 / 824.2	29.30	0.851	-5.80	35.10	HORIZONTAL	PASSED
190 / 836.6	30.40	1.096	-5.10	35.50	HORIZONTAL	PASSED
251 / 848.8	30.40	1.096	-5.40	35.80	HORIZONTAL	PASSED

Phone closed

GSM mode

Channel / f_c [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
128 / 824.2	30.20	1.047	-4.90	35.10	HORIZONTAL	PASSED
190 / 836.6	30.90	1.230	-4.60	35.50	HORIZONTAL	PASSED
251 / 848.8	30.50	1.122	-5.30	35.80	HORIZONTAL	PASSED

GPRS 2-slots

Channel / f_c [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
128 / 824.2	30.20	1.047	-4.90	35.10	HORIZONTAL	PASSED
190 / 836.6	30.90	1.230	-4.60	35.50	HORIZONTAL	PASSED
251 / 848.8	30.20	1.047	-5.60	35.80	HORIZONTAL	PASSED

2.4. GSM 1900 Test results

Phone opened

GSM mode

Channel / f_c [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
512 / 1850.2	31.70	1.479	-17.30	49.00	HORIZONTAL	PASSED
661 / 1880.0	30.50	1.122	-16.10	46.60	HORIZONTAL	PASSED
810 / 1909.8	31.80	1.514	-16.60	48.40	HORIZONTAL	PASSED

GPRS 2-slots

Channel / f_c [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
512 / 1850.2	29.50	0.891	-19.10	48.60	VERTICAL	PASSED
661 / 1880.0	29.20	0.832	-19.30	48.50	VERTICAL	PASSED
810 / 1909.8	31.80	1.514	-16.60	48.40	HORIZONTAL	PASSED

Phone closed

GSM mode

Channel / f_c [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
512 / 1850.2	31.10	1.288	-17.50	48.60	VERTICAL	PASSED
661 / 1880.0	30.60	1.148	-17.90	48.50	VERTICAL	PASSED
810 / 1909.8	30.20	1.047	-18.20	48.40	HORIZONTAL	PASSED

GPRS 2-slots

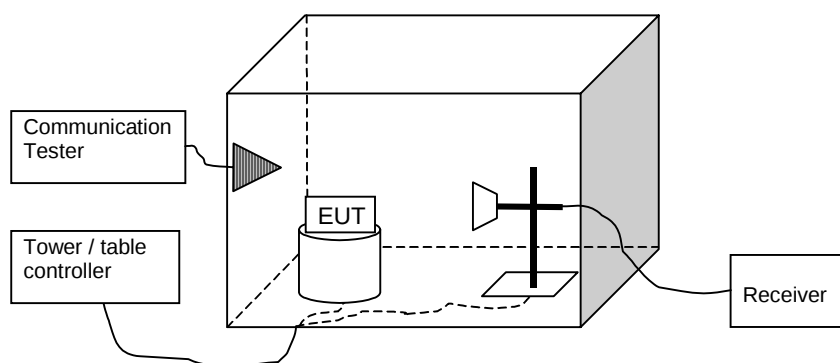
Channel / f_c [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
512 / 1850.2	31.10	1.288	-17.50	48.60	VERTICAL	PASSED
661 / 1880.0	30.60	1.148	-17.90	48.50	VERTICAL	PASSED
810 / 1909.8	30.20	1.047	-18.20	48.40	HORIZONTAL	PASSED

3. Band edge compliance

(FCC §22.917(a), 24.238(a), §27.53(g), RSS-GEN 4.7, RSS-132 4.5, RSS-133 6.3)

EUT with DUT number	RM-259 DUT50790
Accessories with DUT numbers	BL-4B DUT50575; AC-3 DUT50578; HS-47 DUT50727
Operation Voltage [V] / [Hz]	220 / 50
Result	PASSED
Remarks	Test was done with flip open and closed
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20.6 / 9.5 / 101.9 – 20 / 15 / 101.7
Date of measurements	03 – 07..01.2008
Measured by	Zou Ming, Yin Hongpeng

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

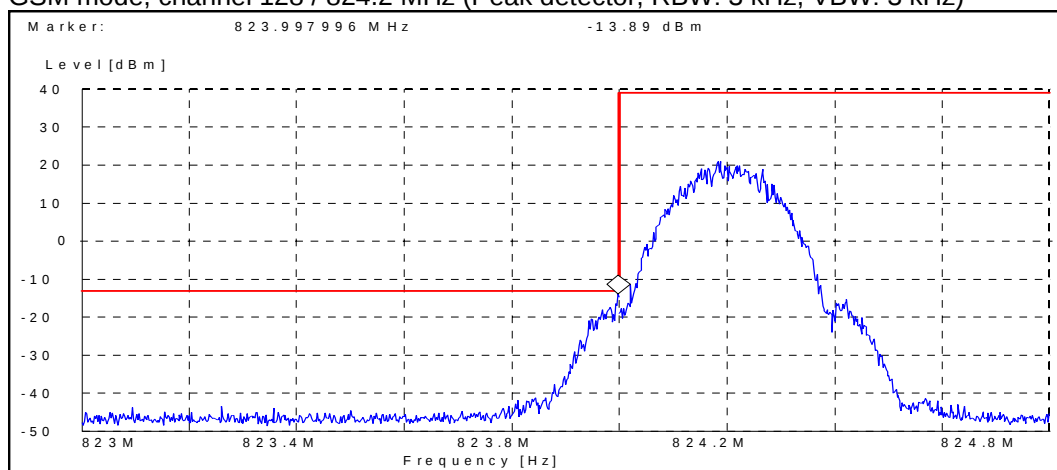
Operation band	Frequency range [MHz]	Limit [dBm]
GSM 850	Below 824 and above 849	-13
GSM 1900	Below 1850 and above 1910	-13

3.3. GSM 850 Test results

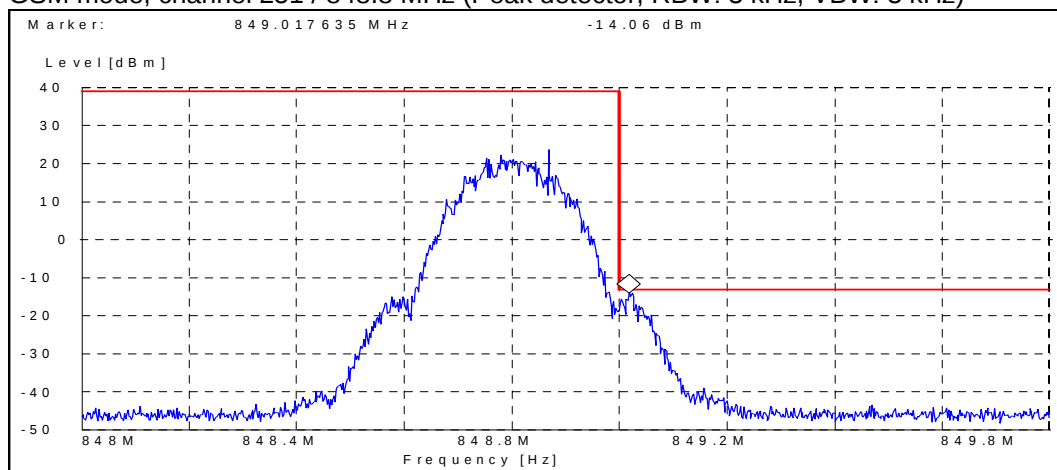
Flip opened

Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]
GSM	128 / 824.2	-13.89
GSM	251 / 848.8	-14.06

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



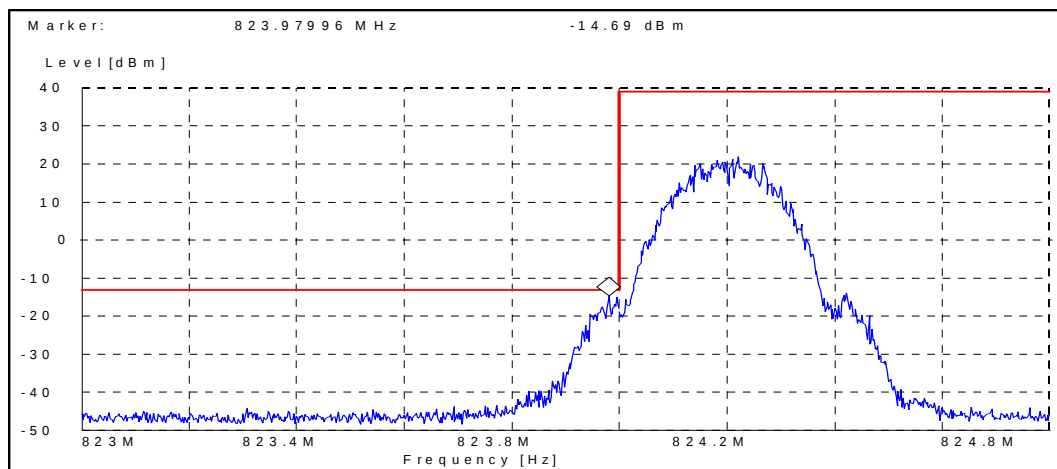
GSM mode, channel 251 / 848.8 MHz (Peak detector, RBW: 3 kHz, VBW: 3 kHz)



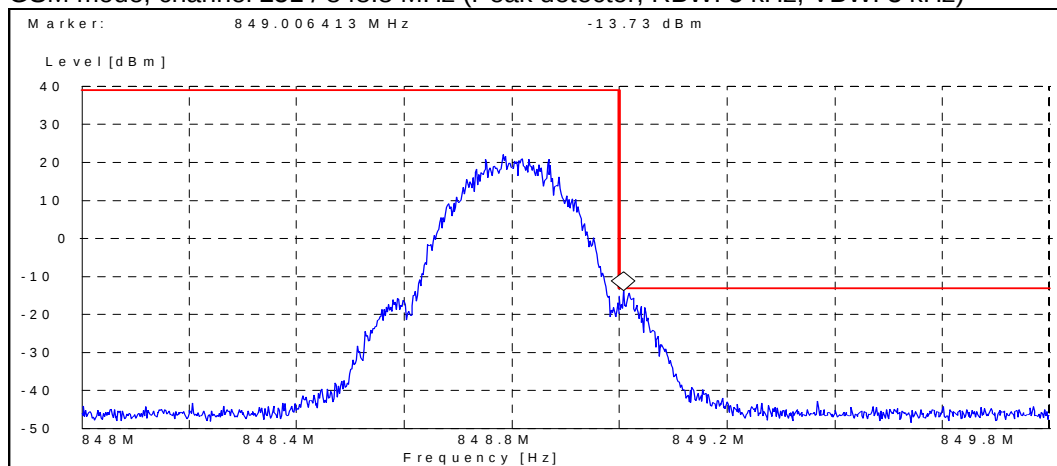
Flip closed

Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]
GSM	128 / 824.2	-14.69
GSM	251 / 848.8	-13.73

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)

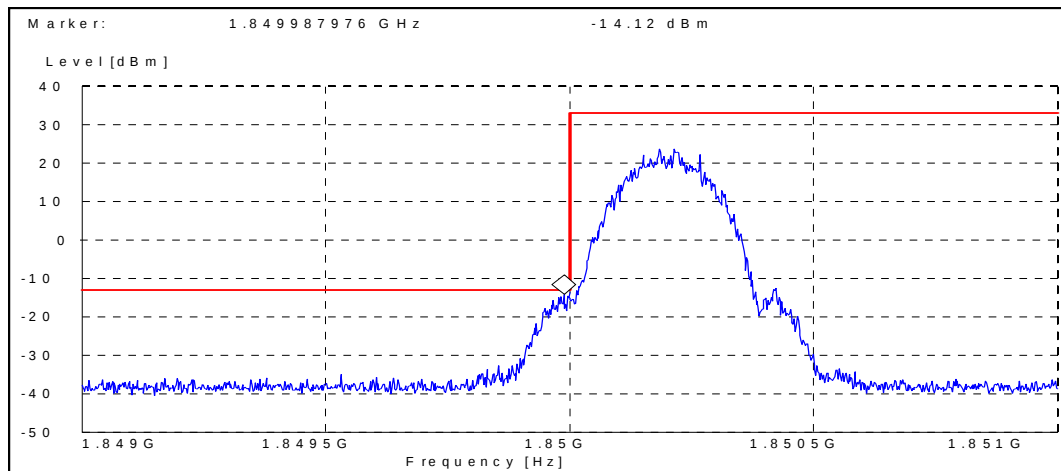


3.4. GSM 1900 Test results

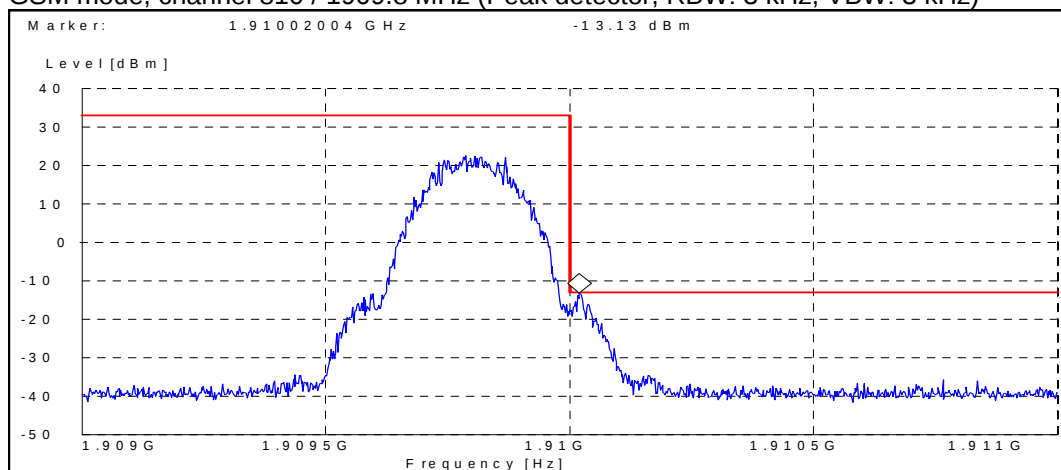
Flip opened

Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]
GSM	512 / 1850.2	-14.12
GSM	810 / 1909.8	-13.13

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



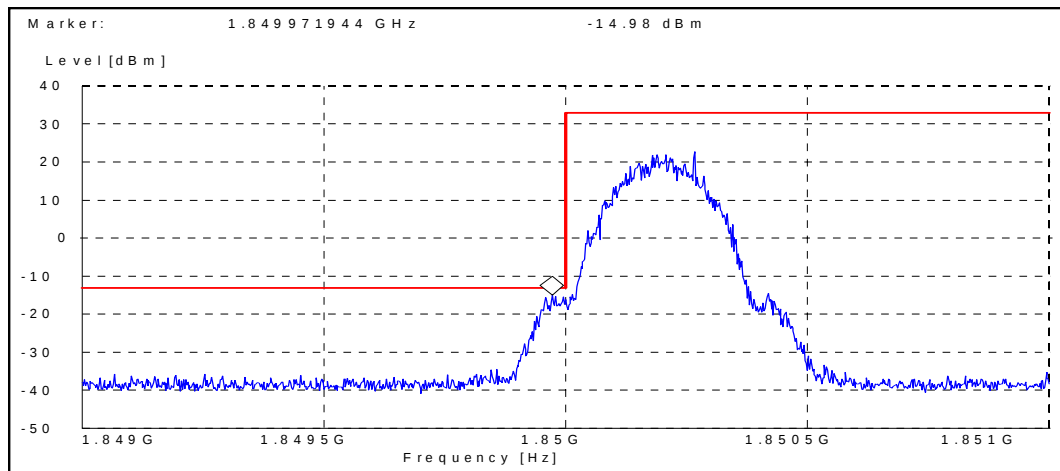
GSM mode, channel 810 / 1909.8 MHz (Peak detector, RBW: 3 kHz, VBW: 3 kHz)



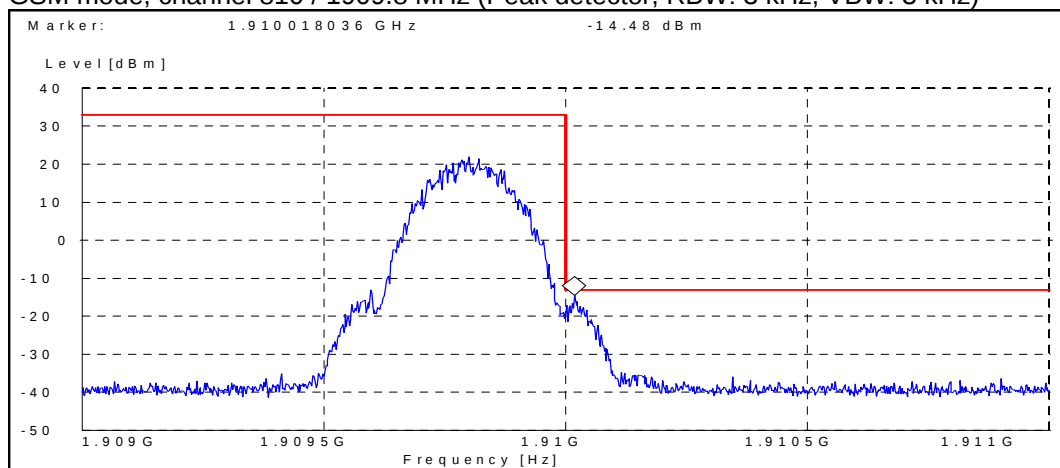
Flip closed

Operation mode (TX on)	Channel / f_c [MHz]	Level [dBm]
GSM	512 / 1850.2	-14.98
GSM	810 / 1909.8	-14.48

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)

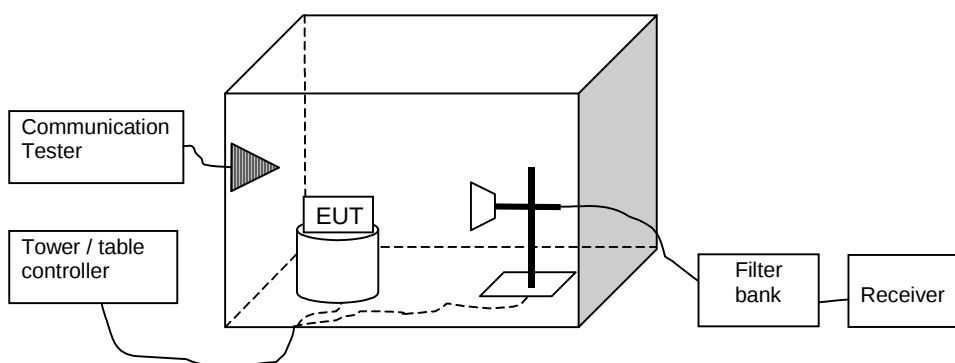


4. Spurious radiated emissions

(FCC §22.917(a), §24.238(a), §27.53(g), §2.1053, RSS-GEN 4.7, RSS-132 4.5, RSS-133 6.3)

EUT with DUT number	RM-259 DUT50790
Accessories with DUT numbers	BL-4B DUT50575; AC-3 DUT50578; HS-47 DUT50727
Operation Voltage [V] / [Hz]	220 / 50
Result	PASSED
Remarks	Test was done with flip open and closed
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	15 / 20 / 101.7
Date of measurements	07.01.2008
Measured by	Zou Ming

4.1. Test setup



4.2. 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]
WCDMA 850	30 - 8500	-13
GSM 1900	30 - 18000	-13

4.3. GSM 850 Test results

Flip opened

GSM mode, channel 190 / 836.6 MHz

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
1673.143287	-38.80	0.13183	-36.90	-1.90	HORIZONTAL	PASSED
2510.026052	-52.20	0.00603	-59.30	7.10	HORIZONTAL	PASSED
3345.689379	-55.00	0.00316	-65.70	10.70	HORIZONTAL	PASSED

Flip closed

GSM mode, channel 190 / 836.6 MHz

Frequency [MHz]	P [dBm]	P [μW]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
1673.143287	-41.90	0.06457	-40.00	-1.90	HORIZONTAL	PASSED
2501.498998	-54.80	0.00331	-61.50	6.70	VERTICAL	PASSED
2509.526052	-47.10	0.01950	-54.20	7.10	HORIZONTAL	PASSED

4.4. GSM 1900 Test results

Flip opened

GSM mode, channel 661 / 1880.0 MHz

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
3760.023046	-37.70	0.16982	-52.10	14.40	HORIZONTAL	PASSED
5639.786573	-40.20	0.09550	-56.40	16.20	VERTICAL	PASSED
7520.042084	-36.50	0.22387	-58.30	21.80	HORIZONTAL	PASSED

Flip closed

GSM mode, channel 661 / 1880.0 MHz

Frequency [MHz]	P [dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
3760.023046	-41.10	0.07762	-55.00	13.90	VERTICAL	PASSED
5639.778557	-38.30	0.14791	-54.50	16.20	VERTICAL	PASSED
7520.042084	-36.50	0.22387	-58.00	21.50	VERTICAL	PASSED

5. Test Equipment

5.1. 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

5.2. 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
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