GSM1900 test report for

RH-26

Report Date: December 02, 2003

Signatures:

Tested by:

Marko Turkkila Testing Engineer

Contents approved:

Tomi Nyberg Laboratory Manager

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1 LABORATORY INFORMATION

Test Laboratory	Konette Design Center Oy EMC Laboratory Koneenkatu 12 / K17 05830 Hyvinkää FINLAND Tel: +358 20 475 2800 Fax: +358 20 475 2719 e-mail: firstname.surname@ette.com
FCC registration number: **IC file number:**	910391 (January 27, 2003) IC 4616 (May 14, 2003)

2 CUSTOMER INFORMATION

Client	Nokia Corporation Keilalahdentie 2-4 02150 Espoo PL 226 00045 NOKIA GROUP Tel: 07180 08000
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Receipt of EUT:	October 28, 2003
Testing date:	October 30 – December 02, 2003
Report date:	December 02, 2003

The tests listed in this report have been done to demonstrate compliance with the applicable requirements in FCC rules Part 24 and 2 and IC standard RSS-133.

3 SUMMARY OF TEST RESULTS

Section in CFR 47	Section in RSS-133	Test	Result
§2.1046 (a)	6.2	Conducted RF output	-
§24.232 (b)	6.2	Radiated RF output	PASS
§2.1049 (h)	5.6	99% occupied bandwidth	PASS
§24.238 (a)	6.3	Band-edge compliance	PASS
§24.238 (a), §2.1051	6.3	Spurious emissions at antenna terminals	-
§24.238 (a), §2.1053	6.3	Radiated spurious emissions	PASS
§24.235, §2.1055 (a)(1)(b)	7	Frequency stability, temperature variation	PASS
§24.235, §2.1055 (d)(1)(2)	7	Frequency stability, voltage variation	PASS

PASS Pass
FAIL Fail
X Measured, but there is no applicable performance criteria
\- Not done

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4 EUT INFORMATION

The EUT and accessories used in the tests are listed below. Later in this report only EUT numbers are used as reference.

	Device	Type	S/N	EUT number
EUT	GSM 1900 Mobile phone	RH-26	004400 21 165122 7	07001
	GSM 1900 Mobile phone	RH-26	004400 21 165135 9	07002
Accessories	Battery	BL-5C		07003
	Battery	BL-5C		07004

Notes: -

4.1 EUT description

EUT is a triple band (GSM850 / GSM 1800 / GSM 1900) mobile phone.

The EUT was not modified during the tests.

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5 EUT TEST SETUPS

For each test the EUT was exercised to find out the worst case of operation modes and device configuration.

The test setup photographs are in the document referenced in section 14.

6 APPLICABLE STANDARDS

The tests were performed in guidance of CFR 47 part 24, part 2, ANSI C63.4-1992, ANSI/TIA/EIA-603-A-2001 and RSS-133.

Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method" for each test case.

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7 RADIATED RF OUTPUT POWER

EUT	07001		
Accessories	07003, 07004		
Temp, Humidity, Air Pressure	22 ºC	55 RH%	1012 hPa
Date of measurement	October 28, 2003		
FCC rule part	§24.232 (b)		
RSS-133 section	6.2		
Measured by	Marko Turkkila		

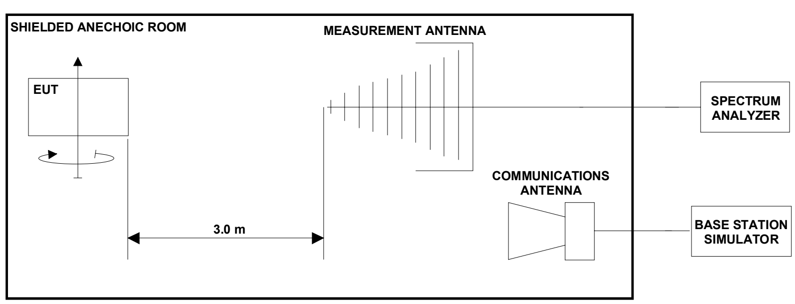
7.1 Test setup

The EUT was set on a non-conductive turntable in a semi-anechoic chamber. In the corner of the chamber there was a communications antenna, which was connected to the BS simulator located outside the chamber.

The radiated power from the EUT was measured with an antenna fixed to an antenna tower. Antenna polarization and height can be changed remotely. The turntable is remotely controlled to turn the EUT

The EUT was set at 0.8m height. Measuring antenna was scanned 1 – 4 m in height.
The measured signal was routed from the measuring antenna to the spectrum analyzer.

The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.



Picture 1: Test setup for radiated RF output power measurement

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7.2 Test method

1. Substitution method calibration was made for determining correction factors for horizontal and vertical polarization. In the calibration the EUT was substituted with a signal generator and antenna, which gain over isotropic and dipole radiator was known.

2. The maximum power level was searched by moving the turntable, by manipulating the EUT and by changing the measurement antenna polarization and height. The maximum measured level (P_{EUT}) was recorded.

3. The measured power from EUT was corrected with the correction factor in an automated test system to give the EUT EIRP.

7.3 EUT operation mode

EUT operation mode	TX on, 1 time slot transmission, PRBS 2E9-1 modulation
EUT channel	512, 661, 810
EUT TX power level	GSM 0 (30dBm) EDGE E2 (+26dBm)

7.4 Limit

EIRP [W]	
FCC	≤ 2
IC	≤ 2

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7.5 Results

The formula below was used to calculate the EIRP of the EUT.

$$P_{EIRP}[W] = \frac{10^{(P_{EUT}[dBm]+(P_{Subst\_RX}[dBm]-P_{Subst\_TX}[dBm]+L_{Cable}[dB]-G_{Substitute\_antenna}[dBi]))/10}}{1000}$$

$$= \frac{10^{(P_{EUT}[dBm]+CF[dB])/10}}{1000}$$

where the variables are as follows:

$P_{\mathrm{EUT}\,[\mathrm{dBm}]}$	Measured power level (from step 2 in 7.2) from the EUT
$P_{\mathrm{Subst\_TX}\,[\mathrm{dBm}]}$	Power (step 1 in 7.2) fed to the substituting antenna
$P_{\mathrm{Subst\_RX}\,[\mathrm{dBm}]}$	Power (step 1 in 7.2) received with the spectrum analyzer
$G_{\mathrm{Substitute\_antenna}\,[\mathrm{dBi}]}$	Gain of the substitutive antenna over isotropic radiator
$L_{\mathrm{Cable}\,[\mathrm{dB}]}$	Loss of the cable between signal generator and the substituting antenna
CF [dB]	Correction factor combined from the $P_{\mathrm{Subst\_TX}\,[\mathrm{dBm}]}$, $P_{\mathrm{Subst\_RX}\,[\mathrm{dBm}]}$, $G_{\mathrm{Substitute\_antenna}\,[\mathrm{dBi}]}$ and $L_{\mathrm{Cable}\,[\mathrm{dB}]}$ used in the automated measurement system (step 3 in 7.2).

In the tables below, the abbreviated column titles are:

EUT H / V	EUT orientation, Horizontal / Vertical
Pol H / V	Measuring antenna polarization, Horizontal / Vertical
Height [m]	Measuring antenna height from reference ground in meters
TT [deg]	Turn table angle in degrees

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Table 1: Radiated RF output power measurement results, GSM GMSK, flip closed.

EUT Channel	P_{EUT} [dBm]	CF [dB]	EIRP [dBm]	EIRP [W]	EUT H / V	Pol. H / V	Height [m]	TT [deg]
512	-15,1	44,1	29,0	0,79	H	H	125,0	45,0
661	-14,5	44,2	29,7	0,93	H	H	123,0	38,0
810	-13,1	44,4	31,3	1,35	H	H	122,0	40,0

Table 2: Radiated RF output power measurement results, GSM GMSK, flip open.

EUT Channel	P_{EUT} [dBm]	CF [dB]	EIRP [dBm]	EIRP [W]	EUT H / V	Pol. H / V	Height [m]	TT [deg]
512	-15,5	44,1	28,6	0,72	H	H	126,0	52,0
661	-15,2	44,2	29,0	0,79	H	H	122,0	55,0
810	-15	44,4	29,4	0,87	H	H	122,0	65,0

Table 3: Radiated RF output power measurement results, flip closed, GSM EDGE 8 PSK modulation.

EUT Channel	P_{EUT} [dBm]	CF [dB]	EIRP [dBm]	EIRP [W]	EUT H / V	Pol. H / V	Height [m]	TT [deg]
512	-17,8	44,1	26,3	0,43	H	H	120,0	40,0
661	-20,9	44,2	23,3	0,21	V	V	100,0	195,0
810	-16,3	44,4	28,1	0,65	H	V	120,0	40,0

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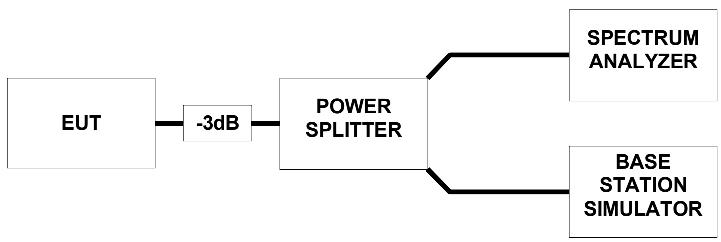
8 99% OCCUPIED BANDWIDTH

EUT	07002		
Accessories	07003, 07004		
Temp, Humidity, Air Pressure	22ºC	48 RH%	1025 hPa
Date of measurement	November 12, 2003		
FCC rule part	§2.1049 (h)		
RSS-133 section	5.6		
Measured by	Marko Turkkila		

8.1 Test setup

The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.



Picture 2: Test setup for 99% occupied bandwidth measurement

8.2 EUT operation mode

EUT operation mode	TX on, 1 time slot transmission,
EUT channel	512, 661, 810
EUT TX power level	GSM 0 (+30dBm) EDGE E2 (+26dBm)

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8.3 Results

The 99% occupied bandwidth was calculated from spectrum analyzer measurements.
The measurement data was read from the analyzer to computer.
Software in computer calculated the total power from the measurement data and defined the frequency band containing 99% of the total power.
Markers in the spectrum analyzer were then placed between the calculated frequencies to show the calculated 99% power band in the screenshots.

Table 4: 99% occupied bandwidth measurement results, GSM GMSK modulation

EUT Channel	99% occupied bandwidth [kHz]
512	244
661	244
810	243

Table 5: 99% occupied bandwidth measurement results, GSM EDGE 8PSK modulation

EUT Channel	99% occupied bandwidth [kHz]
512	245
661	242
810	245

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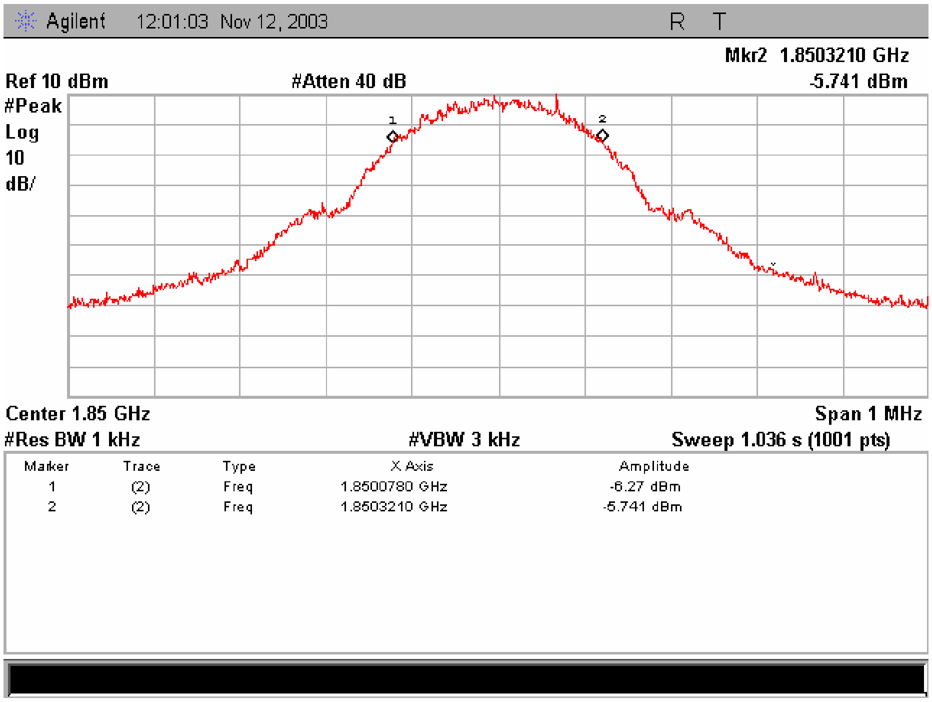
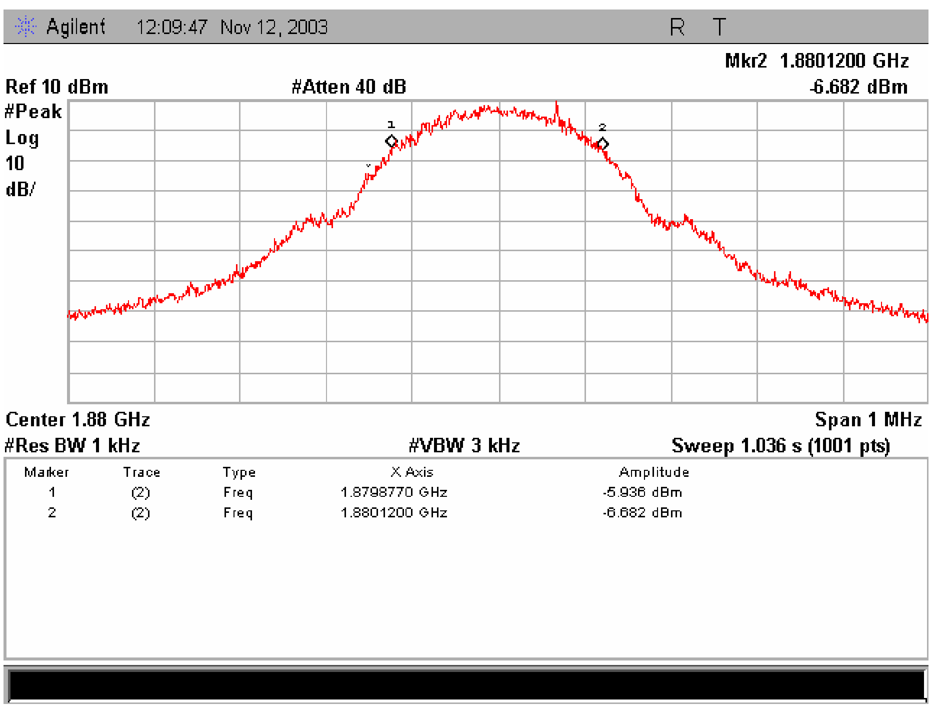
8.4 Screen shots



Picture 3: 99% occupied bandwidth, GSM GMSK, channel 512



Picture 4: 99% occupied bandwidth, GSM GMSK, channel 661

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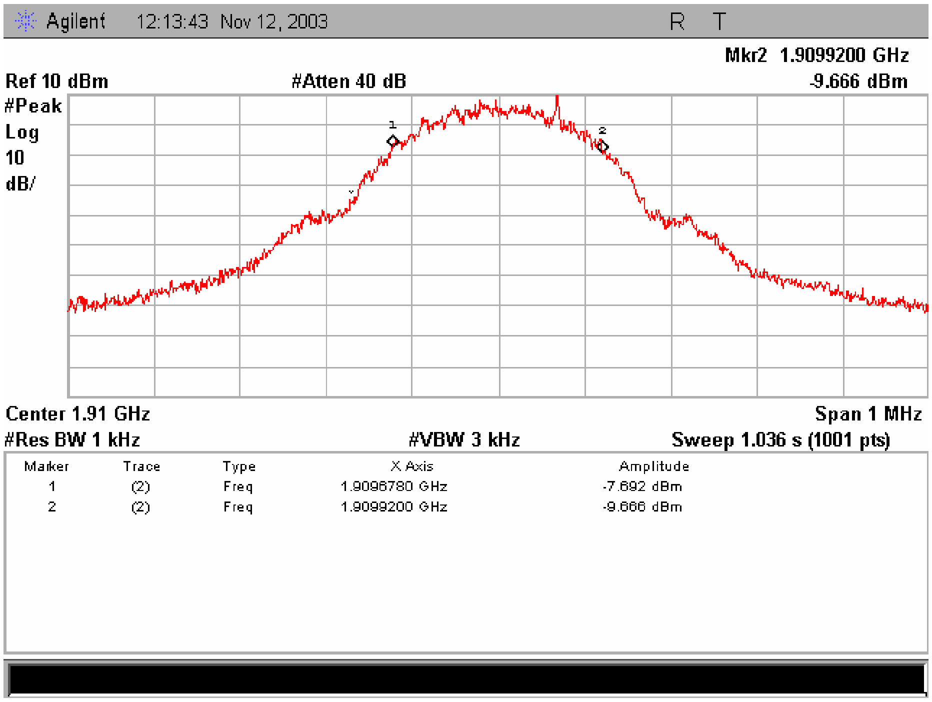
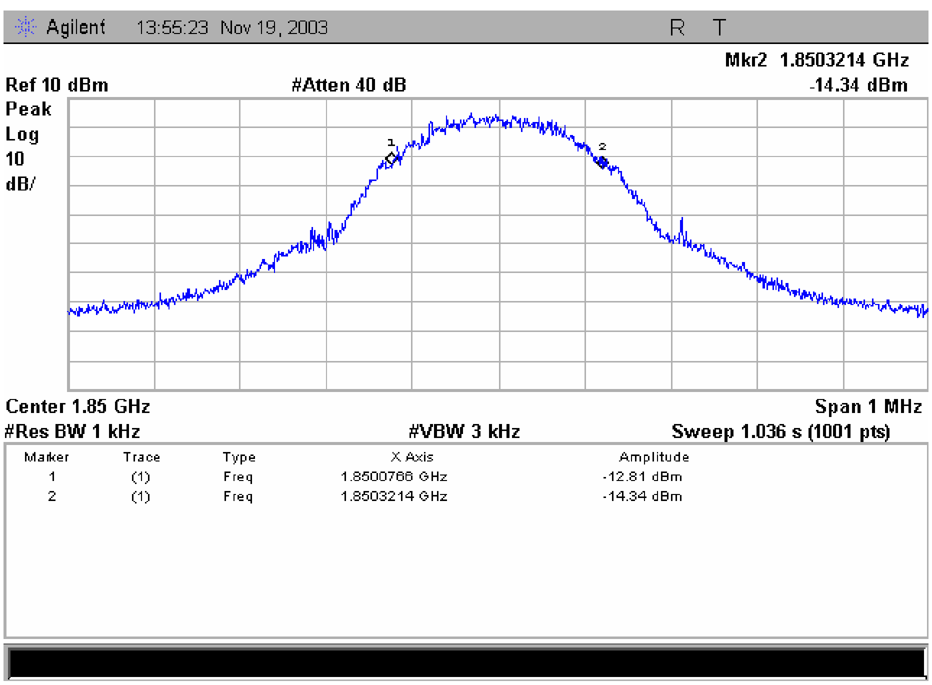


Picture 5: 99% occupied bandwidth, GSM GMSK, channel 810



Picture 6: 99% occupied bandwidth, GSM EDGE 8PSK, channel 512

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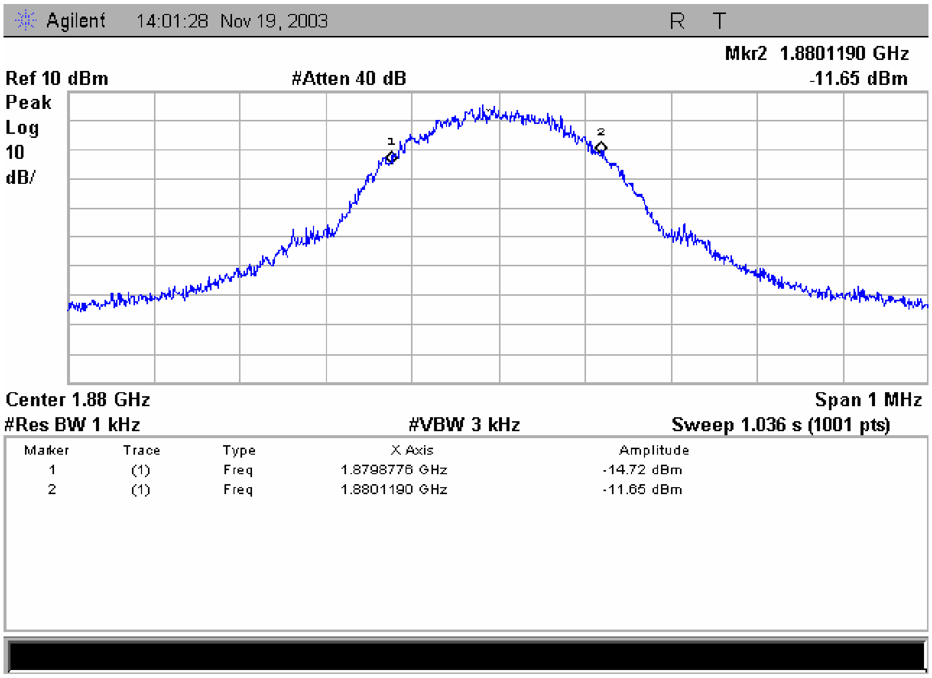
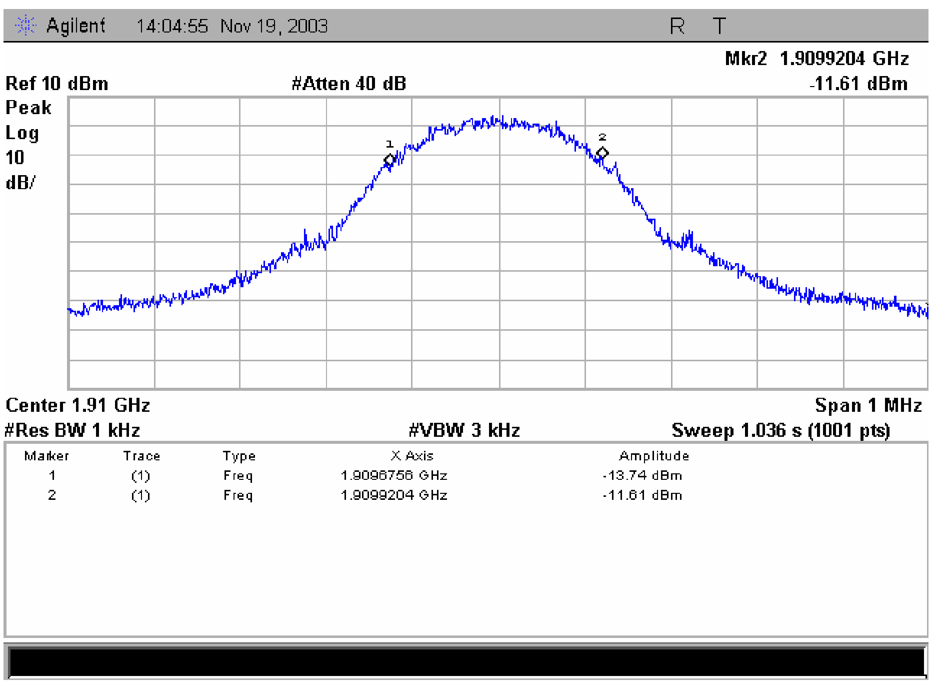


Picture 7: 99% occupied bandwidth, GSM EDGE 8PSK, channel 661



Picture 8: 99% occupied bandwidth, GSM EDGE 8PSK, channel 810

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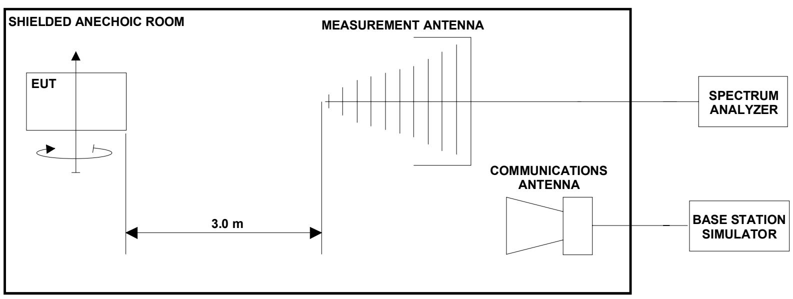
9 BAND-EDGE COMPLIANCE

EUT	07001		
Accessories	07003, 07004		
Temp, Humidity, Air Pressure	21ºC	55 RH%	1023 hPa
Date of measurement	December 02, 2003		
FCC rule part	§24.238 (a)		
RSS-133 section	6.3		
Measured by	Marko Turkkila		

9.1 Test setup

The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.



Picture 9: Test setup for band edge compliance measurement

Band edge power measurements were made as radiated measurement similar to radiated power measurement. The worst turntable angle, antenna height and antenna polarisation found in radiated power measurements were used.

Base station simulator was used to set the EUT channel, modulation and power level.

Power level at the band edge was measured with spectrum analyzer. Measured reading was corrected in the spectrum analyzer by setting correction factor calculated in radiated power measurement section (7.5), as offset.

9.2 EUT operation mode

EUT operation mode	TX on, 1 time slot transmission
EUT channel	Channels listed in section 9.4
EUT TX power level	GSM 0 (+30dBm) EDGE E2 (+26dBm)

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9.3 Limit

Frequency [MHz]	Level [dBm]
<1850	-13
>1910	-13

9.4 Results

The line in the screen shots is the -13dBm limit line. The results were corrected with “offset” value described in test setup section.

Table 6: Band edge compliance measurement results, GSM GMSK modulation

EUT Channel	Offset [dB]	Band edge power [dBm]	Antenna Height	Antenna Pol.	EUT Orient.	Turn table Angle
512	44.1	-16.66	1.3	H	H	45
810	44.4	-13.54	1.2	H	H	40

Table 7: Band edge compliance measurement results, GSM EDGE 8PSK modulation

EUT Channel	Offset [dB]	Band edge power [dBm]	Antenna Height	Antenna Pol.	EUT Orient.	Turn table Angle
512	44.1	-21.35	1.3	H	H	45
810	44.4	-19.49	1.2	V	H	40

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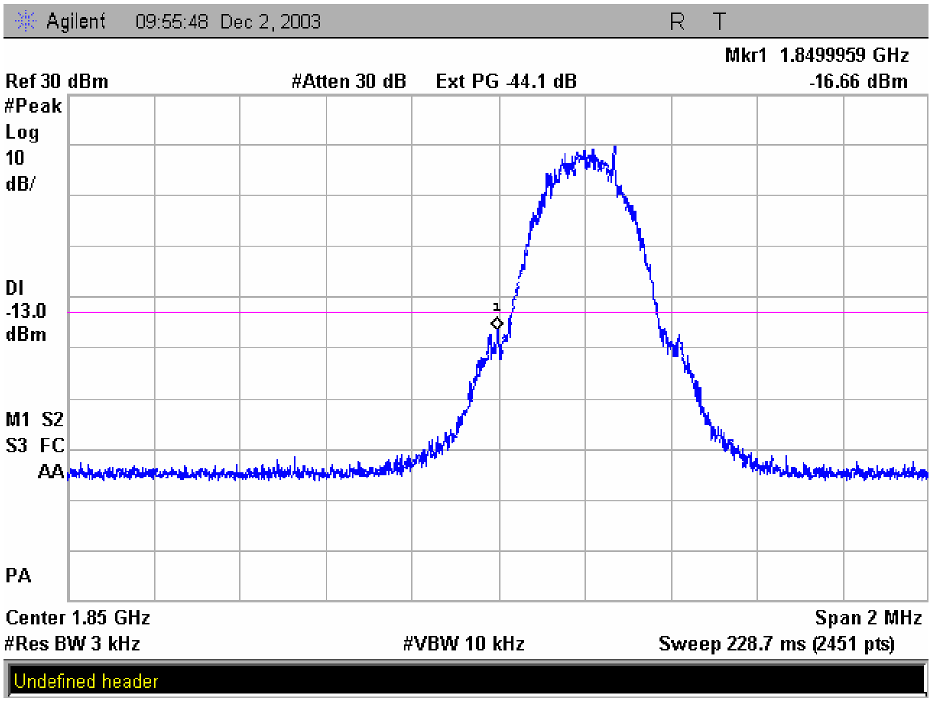
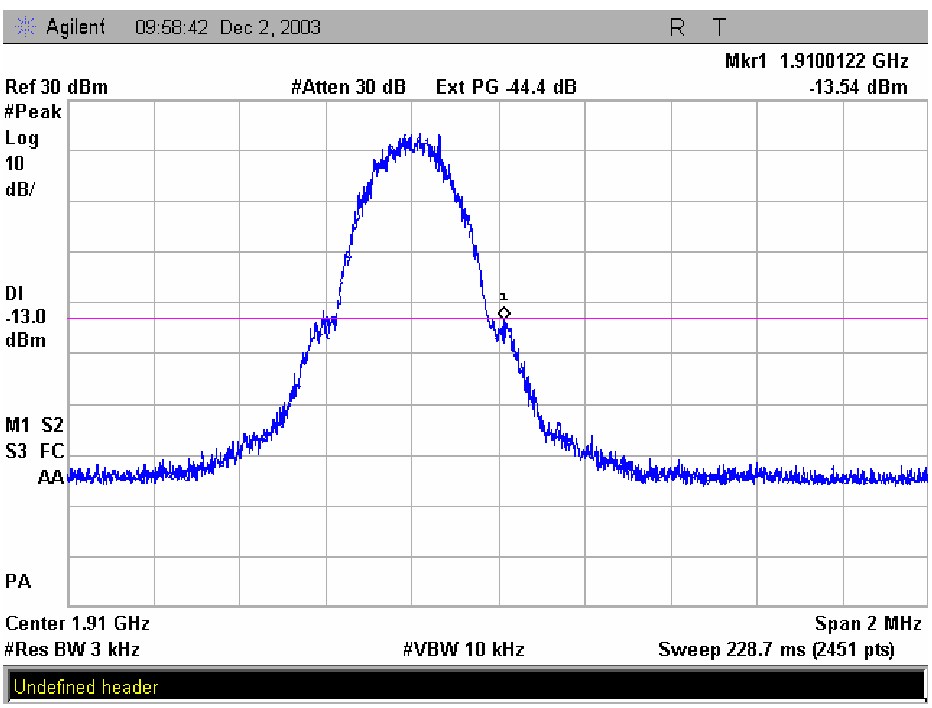
9.5 Screen shots



Picture 10: GSM GMSK, channel 512



Picture 11: GSM GMSK, channel 810

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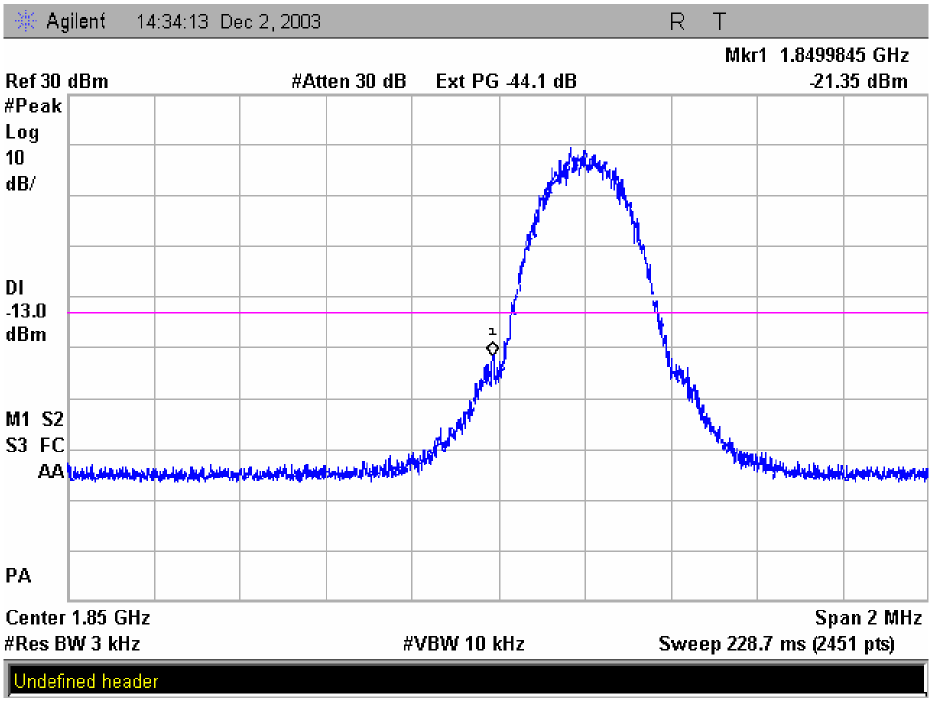
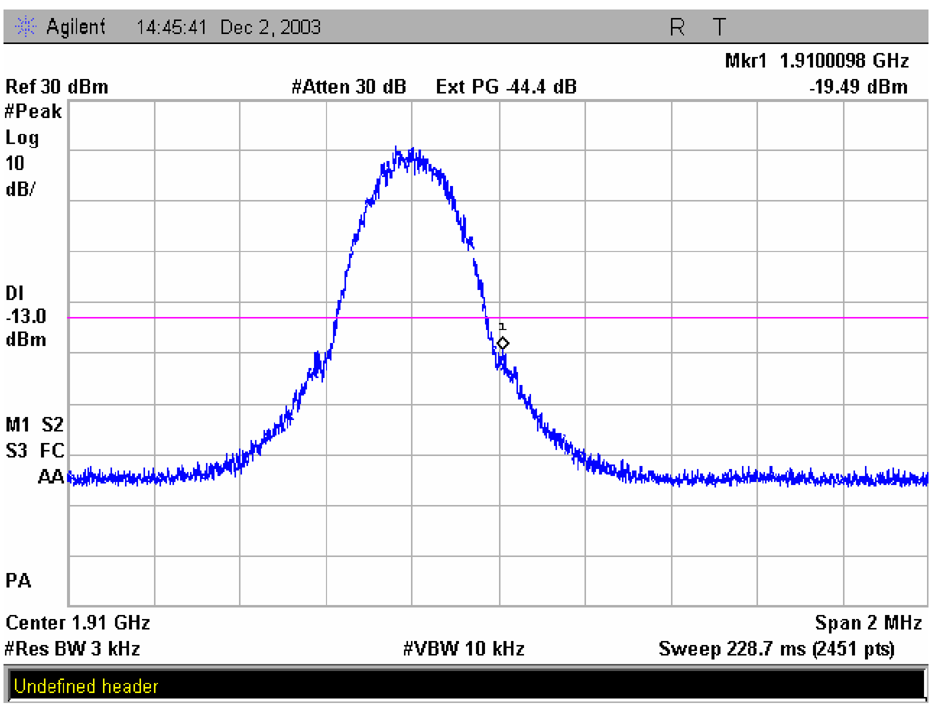


Picture 12: GSM EDGE 8PSK, channel 512



Picture 13: GSM EDGE 8PSK, channel 810

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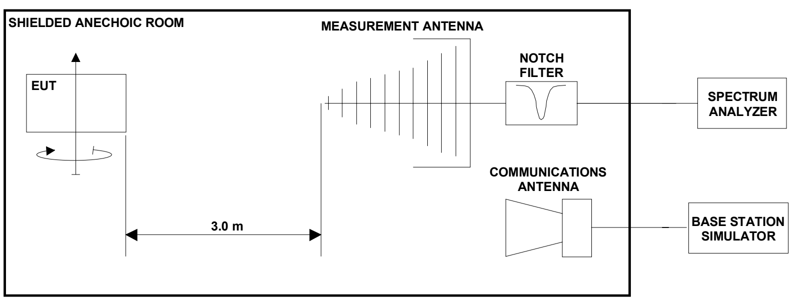
10 RADIATED SPURIOUS EMISSIONS

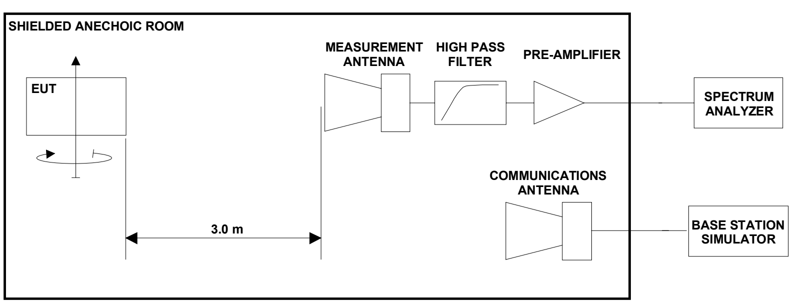
EUT	07001		
Accessories	07003, 07004		
Temp, Humidity, Air Pressure	21ºC	55 RH%	1015 hPa
Date of measurement	November 02 – 18, 2003		
FCC rule part	§24.238 (a), §2.1053		
RSS-133 section	6.3		
Measured by	Marko Turkkila, Kimmo Aarnio, Tuomo Hahl		

10.1 Test setup

Band reject and high pass filters was used to prevent overloading the spectrum analyzer and preamplifier.
The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.
The test was done using an automated test system, where the measurement equipment was controlled by a computer.



Picture 14: Test setup for radiated spurious emissions measurement on below 3 GHz frequencies



Picture 15: Test setup for radiated spurious emissions measurement on 3 GHz and above frequencies

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10.2 Test method

1. The emissions were searched and maximized by moving the turntable, changing the measuring antenna polarization and height and manipulating the EUT.

2. Levels of suspicious signals and levels of EUT transmitter harmonics were recorded.

3. The recorded levels were corrected in the automated test system with the correction factor given by a substitution calibration made before the measurements. The calibration is made separately for vertical and horizontal polarization and the system uses different correction factors depending on the measuring antenna polarization.

4. The corrected values, giving the EUT radiated spurious emission levels as e.i.r.p, are reported.

10.3 EUT operation mode

EUT operation mode	TX on, 1 time slot transmission,
EUT channel	512, 661, 810
EUT TX power level	GSM 0 (+30dBm) EDGE E2(+26dBm)

10.4 Limit

Frequency [MHz]	Level [dBm]
30 – 19100	-13

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10.5 Results

The formula below was used to calculate the EIRP of the spurious emissions.

$$P_{Emission[dBm]} = P_{Measured[dBm]} + \left(P_{SubstRX[dBm]} - P_{SubstTX[dBm]} + L_{Cable[dB]} - G_{Antenna[dBi]}\right)$$
$$= P_{Measured[dBm]} + CF_{[dB]}$$

where the variables are as follows:

$P_{Measured\ [dBm]}$	Measured emission level (from step 2 in 10.2)
$P_{Subst\_TX\ [dBm]}$	Signal generator power (from step 4 in 10.2) fed to the substituting antenna
$P_{Subst\_RX\ [dBm]}$	Measured power (from step 4 in 10.2) in the substitution calibration
$L_{Cable\ [dB]}$	Loss of the cable between antenna and signal generator (from step 4 in 10.2)
$G_{Antenna\ [dBi]}$	Gain of the substitutive antenna over isotropic radiator
$CF_{[dB]}$	Correction factor combined from the $P_{Subst\_TX\ [dBm]}$, $L_{Cable\ [dB]}$ and $G_{Antenna\ [dBi]}$ used in the automated test software

Measurement system noise level was least 15 dB below the spurious emission limit. Only levels of suspicious signals and transmitter harmonic frequencies, which were above the measurement system noise, are reported.

In the tables below, the abbreviated column titles are:

f [MHz]	Measured frequency
EUT H / V	EUT orientation, Horizontal / Vertical
Pol H / V	Measuring antenna polarization, Horizontal / Vertical
Height [m]	Measuring antenna height from reference ground in meters
TT [deg]	Turn table angle in degrees

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GSM GMSK modulation, flip closed

Table 8: Radiated spurious emission levels, GSM GMSK, flip closed, Channel 512

f [MHz]	$P_{Measured}$ [dBm]	*CF* [dB]	$P_{Emission}$ [dBm]	EUT H / V	Pol. H / V	Height [m]	TT [deg]
3700.4	-30.2	7.2	-23.0	V	V	1.6	200.0
5550.6	-45.9	14.7	-31.2	H2	V	1.2	243.0
7400.8	-57.7	18.4	-39.3	H2	V	1.8	184.0
9251.0	-54.2	18.9	-35.3	V	V	1.5	260.0
11101.2	-55.7	22.6	-33.1	H2	V	1.4	176.0

Table 9: Radiated spurious emission levels, GSM GMSK, flip closed, Channel 661

f [MHz]	$P_{Measured}$ [dBm]	*CF* [dB]	$P_{Emission}$ [dBm]	EUT H / V	Pol. H / V	Height [m]	TT [deg]
3760.0	-35.1	7.3	-27.8	V	V	1.0	210.0
5640.0	-50.1	14.9	-35.2	H2	V	1.2	226.0
7520.0	-56.9	18.2	-38.7	V	V	1.2	170.0
9400.0	-55.7	18.6	-37.1	V	V	1.0	260.0
11280.0	-57.5	23.1	-34.4	H2	V	1.3	29.0

Table 10: Radiated spurious emission levels, GSM GMSK, flip closed, Channel 810

f [MHz]	$P_{Measured}$ [dBm]	*CF* [dB]	$P_{Emission}$ [dBm]	EUT H / V	Pol. H / V	Height [m]	TT [deg]
3819.6	-38.0	7.5	-30.5	V	V	1.0	220.0
5729.4	-53.8	15.1	-38.7	H2	V	1.7	229.0
7639.2	-54.6	18.5	-36.1	V	V	1.0	180.0
9549.0	-57.2	18.5	-38.7	V	V	1.5	100.0
11458.8	-57.0	23.6	-33.4	H1	V	1.6	100.0

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GSM GMSK modulation, flip open

Table 11: Radiated spurious emission levels, GSM GMSK, flip open, Channel 512

f [MHz]	$P_{Measured}$ [dBm]	*CF* [dB]	$P_{Emission}$ [dBm]	EUT H / V	Pol. H / V	Height [m]	TT [deg]
3700.4	-29.5	7.2	-22.3	V	V	1.2	210.0
5550.6	-47.4	14.7	-32.7	H2	V	1.0	267.0
7400.8	-56.1	18.4	-37.7	V	V	1.4	160.0
9251.0	-54.4	18.9	-35.6	H1	V	1.6	300.0
11101.2	-57.2	22.6	-34.5	H1	V	1.2	300.0

Table 12: Radiated spurious emission levels, GSM GMSK, flip open, Channel 661

f [MHz]	$P_{Measured}$ [dBm]	*CF* [dB]	$P_{Emission}$ [dBm]	EUT H / V	Pol. H / V	Height [m]	TT [deg]
3760.0	-35.6	7.3	-28.3	V	V	1.4	240.0
5640.0	-51.0	14.9	-36.1	H2	V	1.6	230.0
7520.0	-54.8	18.2	-36.6	V	V	1.1	180.0
9400.0	-57.3	18.6	-38.7	H1	V	1.5	280.0
11280.0	-57.3	23.1	-34.2	H2	V	1.3	114.0

Table 13: Radiated spurious emission levels, GSM GMSK, flip open, Channel 810

f [MHz]	$P_{Measured}$ [dBm]	*CF* [dB]	$P_{Emission}$ [dBm]	EUT H / V	Pol. H / V	Height [m]	TT [deg]
3819.6	-37.3	7.5	-29.9	V	V	1.0	250.0
5729.4	-53.8	15.1	-38.7	H2	V	1.0	184.0
7639.2	-55.4	18.5	-37.0	V	V	1.0	180.0
9549.0	-57.5	18.5	-38.9	V	V	1.0	100.0
11458.8	-56.2	23.6	-32.6	H2	V	1.3	1.0

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GSM EDGE 8PSK modulation, flip closed

Table 14: Radiated spurious emission levels, GSM EDGE 8PSK, flip closed, Channel 512

f [MHz]	$P_{Measured}$ [dBm]	*CF* [dB]	$P_{Emission}$ [dBm]	EUT H / V	Pol. H / V	Height [m]	TT [deg]
3700.4	-31.7	7.2	-24.6	V	V	1.6	200.0
5550.6	-47.8	14.7	-33.1	H2	V	1.1	238.0
7400.8	-60.8	18.4	-42.5	V	V	1.0	0.0
9251.0	-57.2	18.9	-38.3	V	V	1.5	260.0
11101.2	-57.0	22.6	-34.4	H2	V	1.4	184.0

Table 15: Radiated spurious emission levels, GSM EDGE 8PSK, flip closed, Channel 661

f [MHz]	$P_{Measured}$ [dBm]	*CF* [dB]	$P_{Emission}$ [dBm]	EUT H / V	Pol. H / V	Height [m]	TT [deg]
3760.0	-36.3	7.3	-29.0	V	V	1.0	220.0
5640.0	-53.5	14.9	-38.6	H2	V	1.6	228.0
7520.0	-58.2	18.2	-40.0	V	V	1.0	180.0
9400.0	-59.5	18.6	-40.9	V	V	1.0	100.0
11280.0	-56.6	23.1	-33.5	H2	V	1.3	34.0

Table 16: Radiated spurious emission levels, GSM EDGE 8PSK, flip closed, Channel 810

f [MHz]	$P_{Measured}$ [dBm]	*CF* [dB]	$P_{Emission}$ [dBm]	EUT H / V	Pol. H / V	Height [m]	TT [deg]
3819.6	-40.2	7.5	-32.8	V	V	1.5	210.0
5729.4	-56.8	15.1	-41.7	H2	V	1.6	220.0
7639.2	-57.2	18.5	-38.7	H2	V	1.6	181.0
9549.0	-60.1	18.5	-41.6	V	V	1.0	120.0
11458.8	-56.1	23.6	-32.5	H1	V	1.5	100.0

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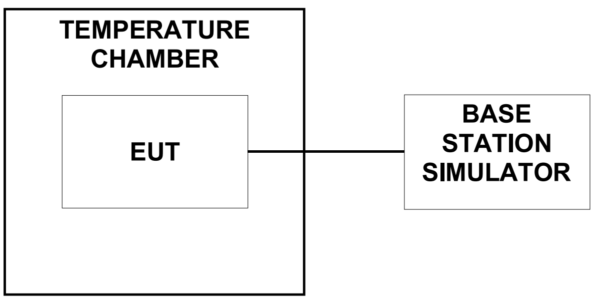
11 FREQUENCY STABILITY, TEMPERATURE VARIATION

EUT	07002		
Accessories	07003		
Temp, Humidity, Air Pressure	- ºC	- RH%	- hPa
Date of measurement	October 30, 2003		
FCC rule part	§24.235, §2.1055 (a)(1)(b)		
RSS-133 section	7		
Measured by	Marko Turkkila		

11.1 Test setup

The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.



11.2 EUT operation mode

EUT operation mode	TX on, 1 time slot transmission, PRBS 2E9-1 modulation
EUT channel	661
EUT TX power level	GSM 0 (+30dBm)

11.3 Limit

Frequency deviation [ppm]
± 2.5

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11.4 Test method

1. The climate chamber temperature was set to the minimum value and the temperature was allowed to stabilize.
2. The EUT was placed in the chamber
3. The EUT was set in idle mode for 45 minutes.
4. The EUT was set to transmit.
5. The maximum of transmit frequency error was measured immediately from BS simulator
6. The steps 3 - 5 were repeated for each temperature

11.5 Results

Table 17: Frequency stability over temperature measurement results

Temperature [ºC]	Deviation [Hz]	Deviation [ppm]
-30	40	0,021
-20	28	0,015
-10	25	0,013
0	27	0,014
10	32	0,017
20	24	0,013
30	23	0,012
40	33	0,018
50	34	0,018

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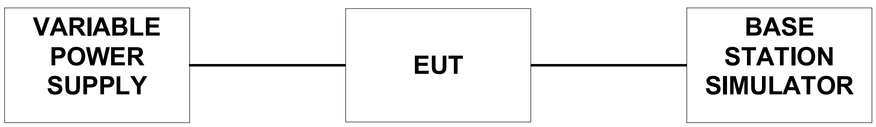
12 FREQUENCY STABILITY, VOLTAGE VARIATION

EUT	07002		
Accessories	07003		
Temp, Humidity, Air Pressure	22 ºC	43 RH%	1015 hPa
Date of measurement	November 24, 2003		
FCC rule part	§24.235, §2.1055 (d)(1)(2)		
RSS-133 section	7		
Measured by	Marko Turkkila		

12.1 Test setup

The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.



Picture 16: Test setup for frequency deviation over voltage variation measurement

12.2 EUT operation mode

EUT operation mode	TX on, 1 time slot transmission, PRBS 2E9-1 modulation
EUT channel	661
EUT TX power level	GSM 0 (+30dBm)

12.3 Limit

Frequency deviation [ppm]
± 2.5

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12.4 Test method

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.

12.5 Results

Table 18: Frequency stability over voltage variation measurement results

Level	Voltage [V]	Deviation [Hz]	Deviation [ppm]
Nominal	3.7	-13.80	0.007
Battery cut-off point	3.4	62.9	0.033

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13 TEST EQUIPMENT

All testing and measurement equipment has been calibrated once a year, except the antennas which are calibrated every two years.

13.1 Conducted measurements

Equipment	Manufacturer	Model
Spectrum Analyzer	Agilent	E7405A
GSM Base station simulator	Rohde & Schwarz	CMU 200
GSM Base station simulator	Anritsu	MT8820A
Signal Generator	Rohde & Schwarz	SMR27
Attenuator 3 dB	Narda	779-3
Power splitter	Mini Circuits	ZFSC-2-4
Power splitter	Narda	4426-2
Temperature chamber	Finero	LK 540
DC power supply	Delta Elektronika	SM 120-13
Multimeter	Fluke	179

13.2 Radiated measurements

Equipment	Manufacturer	Model
Spectrum Analyzer	Agilent	E7405A
GSM Base station simulator	Rohde & Schwarz	CMU 200
Antenna	Chase	CBL 6140
Antenna	Schwarzbeck	BBHA 9120D
Antenna	Chase	CBL 6141
Antenna	EMCO	3115
Signal Generator	Rohde & Schwarz	SMR27
Tunable notch filter	Wainwright Instruments	WRCD 1700/2000-0.2/40-10EEK
Tunable notch filter	Wainwright Instruments	WRCT 800/960-0.2/40-8EEK
High pass filter	Wainwright Instruments	WHK3/18GST
High pass filter	Wainwright Instruments	WHK 2.1/18GST
Band Reject filter	Wainwright instruments	WRCT2400/2483-45/10EE
Pre-amplifier	JCA	118-400
Turn table / antenna mast controller	EMCO	2090
Antenna mast	EMCO	2075-2

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14 TEST SETUP PHOTOGRAPHS

Test setup photographs can be found in a separate document

T03-070A-EMC_PHOTOS.doc

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