TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Ericsson AB
FWT G30a

To: FCC Part 22: 2007, FCC Part 24: 2007,
RSS-132 Issue 2 September 2005, RSS-133 Issue 2 June 2005
& RSS-Gen Issue 2 June 2007

Test Report Serial No:
RFI/RPTE2/RP49304JD19A

Supersedes Test Report Serial No:
RFI/RPTE1/RP49304JD19A

This Test Report Is Issued Under The Authority Of Steve Flooks, Service Leader RPG:  **pp Brian Watson**	
Checked By: Brian Watson 	**Report Copy No: PDF01**
Issue Date: 31 January 2008	**Test Dates: 04 December 2007 to 13 December 2007**

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1. Client Information

1.1. Client

Address:	Flextronics South Africa (Pty) Ltd 260 Surrey Avenue Ferndale Randburg 2194 South Africa
Contact Name:	Mr Bernd Kleyenstuber

1.2. Manufacturer

Address:	Ericsson AB S-126 25 Stockholm Sweden
Contact Name:	Sem Andersson

2. Equipment Under Test (EUT)

The following information (with the exception of the Date of Receipt) has been supplied by the client:

2.1. Identification of Equipment Under Test (EUT)

Description:	Fixed Wireless Terminal
Brand Name:	FWT G30a
Model Name or Number:	G30a
Serial Number:	TU8A305538
IMEI Number:	358211001173088
Hardware Version:	R4A
Software Version:	R2A
FCC ID Number:	P5L-FWTG30-1
Country of Manufacture:	Poland
Date of Receipt:	04 December 2007

2.2. Accessories

The following accessories were supplied with the EUT:

Description:	System Cable
Brand Name:	Ericsson
Cable Length And Type:	2m twin core
Connected to Port:	System Connector

2.3. Description of EUT

The Fixed Wireless Terminal (FWT) provides fixed voice, data and fax services to areas with no fixed infrastructure in a cost efficient way, utilizing an existing GSM infrastructure.

2.4. Modifications Incorporated in EUT

During the course of testing the EUT was not modified.

2.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	Antenna
Brand Name:	Ericsson
Model Name or Number:	Not Stated
Serial Number:	Not Stated
Connected to Port:	SMA

Description:	Telephone Cable
Brand Name:	Ericsson
Model Name or Number:	Not Stated
Serial Number:	Not Stated
Cable Length and Type:	5m, RJ45
Connected to Port:	RJ11

Description:	AC/DC Adaptor
Brand Name:	Ericsson
Model Name or Number:	Not Stated
Serial Number:	Not Stated
Connected to Port:	DC power

Description:	Power Cord
Brand Name:	Ericsson
Cable Length and Type:	1m, twin core
Connected to Port:	DC power

Description:	USB Cable
Brand Name:	Ericsson
Cable Length and Type:	4.5m, USB
Connected to Port:	Mini USB

2.6. Additional Information Related to Testing

Power Supply Requirement:	Nominal 230/240 V, 50 Hz AC Mains Supply Nominal 110 V, 60 Hz AC Mains supply DC Supply of: 7.5 Vdc 1 A
Intended Operating Environment:	Within GSM coverage
Equipment Category:	GSM and EDGE
Type of Unit:	Base Station (fixed use)
Modulation Type:	GMSK and 8PSK
Channel Spacing:	200 kHz
Antenna Type:	Integrated, Omni-directional
Antenna Gain:	2 dBi
Antenna Connection:	SMA plug-female

FCC Part 22

Transmit Frequency Range:	824.2 MHz to 848.8 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	128	824.2
	Middle	189	836.4
	Top	251	848.8
Receive Frequency Range:	869.2 MHz to 893.8 MHz		
Receive Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	128	869.2
	Middle	189	881.4
	Top	251	893.8
Maximum Power Output (ERP):	32.9 dBm		

Additional Information Related to Testing (Continued)

FCC Part 24

Transmit Frequency Range:	1850.2 MHz to 1909.8 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	512	1850.2
	Middle	660	1879.8
	Top	810	1909.8
Receive Frequency Range:	1930.2 MHz to 1989.8 MHz		
Receive Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	512	1930.2
	Middle	660	1959.8
	Top	810	1989.8
Maximum Power Output (EIRP):	28.7 dBm		

2.7. Port Identification

Port	Description	Type / Length	Applicability
1.	Telephone connector	RJ11	Yes
2.	System, maintenance and debug connector	26 Pad	No
3.	USB connector	Mini USB	Yes
4.	Power supply connector	RC 5320, Class 4 connector	Yes
5.	Antenna connector	SMA-female connector	Yes
6.	SIM card holder	Not Applicable	Yes
7.	Battery connector	Not Applicable	No

3. Test Specification, Methods and Procedures

Reference:	FCC Part 22: 2007 Subpart H (Cellular Radiotelephone Service)
Title:	Code of Federal Regulations, Part 22 (47CFR22) Personal Communication Services.

Reference:	FCC Part 24: 2007 Subpart E (Broadband PCS)
Title:	Code of Federal Regulations, Part 24 (47CFR24) Personal Communication Services.

Reference:	RSS-Gen Issue 2 June 2007
Title:	General Requirements and Information for the Certification of Radiocommunication Equipment

Reference:	RSS-132 Issue 2 September 2005
Title:	Cellular Telephones Employing New Technologies Operating in the Bands 824-849 MHz and 869-894 MHz

Reference:	RSS-133 Issue 3 June 2005
Title:	2 GHz Personal Communications Services

3.1. Methods and Procedures

The methods and procedures used were as detailed in:

ANSI/TIA-603-B-2003
Land Mobile Communications Equipment, Measurements and performance Standards

ANSI C63.2 (1987)
Title: American National Standard for Instrumentation - Electromagnetic noise and field strength.

ANSI C63.4 (2003)
Title: American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

ANSI C63.5 (1988)
Title: American National Standard for the Calibration of antennas used for Radiated Emission measurements in Electromagnetic Interference (EMI) control.

ANSI C63.7 (1988)
Title: American National Standard Guide for Construction of Open Area Test Sites for performing Radiated Emission Measurements.

CISPR 16-1: (1999)
Title: Specification For Radio Disturbance and Immunity Measuring Apparatus and Methods. Part 1: Radio Disturbance and Immunity Measuring Apparatus.

3.2. Definition of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the methods & procedures Section above. Appendix 1 contains a list of the test equipment used.

4. Deviations from the Test Specification

There were no deviations from the test speciation.

5. Operation of the EUT during Testing

5.1. Operating Modes

The EUT was tested in the following operating modes, unless otherwise stated.

- Normal Operation Mode - Default operation mode when the device is turned on.
- Voice Call Mode - This is the operation mode when a voice call is active.

5.2. Configuration and Peripherals

The EUT was tested in the following configuration unless otherwise stated:

- Controlled over a radio link using a GSM tester with the EUT transmitting at full power.

6. Summary of Test Results

FCC Part 22 and RSS-132 (GSM 850 band)

Range of Measurements	FCC Part Reference	IC RSS Reference	Port Type	Compliancy Status
Idle Mode Radiated Spurious Emissions	15.109	RSS-Gen 6.0	Enclosure	Complied
Transmitter Effective Radiated Power (ERP)	22.913(a)	RSS-132 4.4	Antenna	Complied
Transmitter Occupied Bandwidth	2.1049	RSS-Gen 4.6.1	Antenna	Complied
Transmitter Out of Band Radiated Emissions	2.1053/22.917	RSS-132 4.5	Antenna	Complied
Transmitter Band Edge Radiated Emissions	2.1053/22.917	RSS-132 4.5	Antenna	Complied

FCC Part 24 and RSS-133 (GSM 1900 band)

Range of Measurements	FCC Part Reference	IC RSS Reference	Port Type	Compliancy Status
Idle Mode Radiated Spurious Emissions	15.109	RSS-133 4.5 & 6.7	Enclosure	Complied
Transmitter Effective Isotropic Radiated Power (EIRP)	24.232	RSS-133 4.3 & 6.4	Antenna	Complied
Transmitter Occupied Bandwidth	24.238	RSS-Gen 4.6.1	Antenna	Complied
Transmitter Out of Band Radiated Emissions	2.1053 & 24.238	RSS-133 4.4 & 6.5	Antenna	Complied
Transmitter Band Edge Radiated Emissions	2.1053 & 24.238	RSS-133 4.4 & 6.5	Antenna	Complied

6.1. Location of Tests

All the measurements described in this report were performed at the premises of
RFI Global Services Ltd, Ewhurst Park, Ramsdell, Basingstoke, Hampshire, RG26 5RQ.

7. Measurements, Examinations and Derived Results

7.1. General Comments

This Section contains test results only.

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to Section 8 for details of measurement uncertainties.

7.2. Test Results – FCC Part 22 and RSS-132 (GSM 850 band)

7.2.1. Receiver/Idle Mode Radiated Spurious Emissions: Section 15.109 - Electric Field Strength Measurements (Frequency Range: 30 to 1000 MHz)

The EUT was configured as for radiated emission - Part 22 measurements as described in Section 9 of this report.

Tests were performed to identify the maximum receiver or standby radiated emission levels.

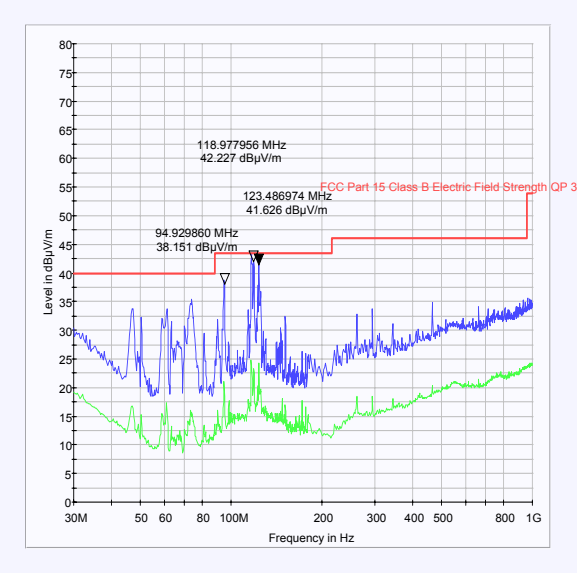
Results:

Frequency (MHz)	Antenna Polarity	Quasi Peak Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
118.741	Vertical	42.2	43	0.8	Complied

Note(s):

1. *All emissions shown on the plot were found to be noise floor or ambient. The highest reading on the plot is recorded in the above table.*

Receiver/Idle Mode Radiated Spurious Emissions: Section 15.109 - Electric Field Strength Measurements (Frequency Range: 30 to 1000 MHz) (Continued)



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.

7.2.2. Receiver/Idle Mode Radiated Spurious Emissions: Section 15.109 - Electric Field Strength Measurements (Frequency Range: 1 to 5 GHz)

Results:

Highest Peak Level

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
3.871743	Vertical	52.8	-6.2	46.6	54.0	7.4	Complied

Note(s):

1. **Note: No spurious emissions were detected above the noise floor of the measuring receiver; therefore, the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above.*
   ***Note: The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit and demonstrates compliance.*

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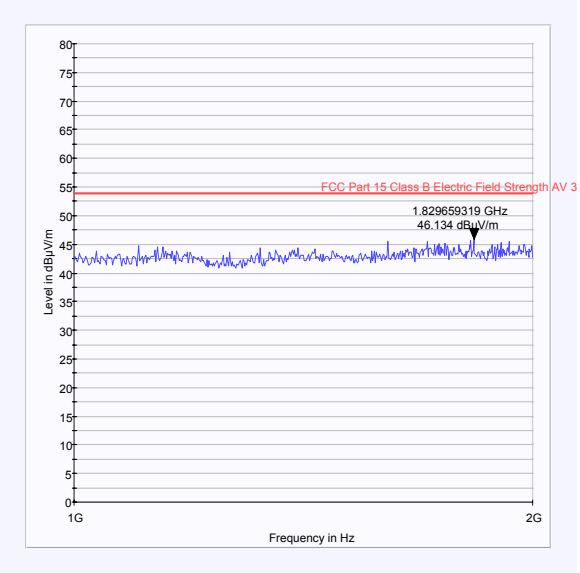
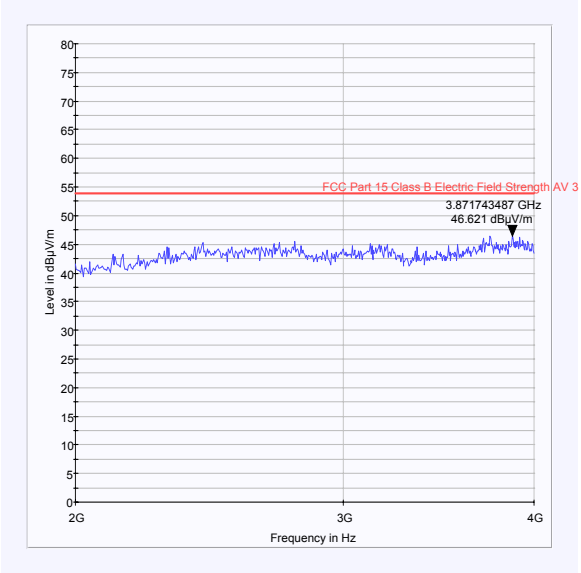
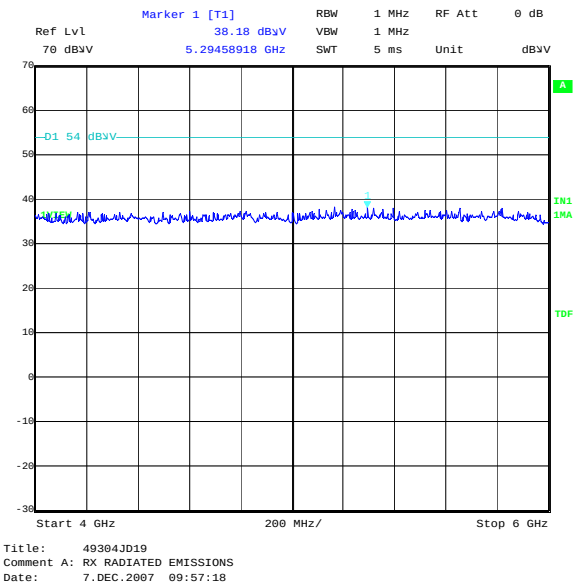
Receiver/Idle Mode Radiated Spurious Emissions: Section 15.109 - Electric Field Strength Measurements (Frequency Range: 1 to 5 GHz) (Continued)







Title: 49304JD19
Comment A: RX RADIATED EMISSIONS
Date: 7.DEC.2007 09:57:18

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

7.2.3. Transmitter Effective Radiated Power (ERP): Section 22.913(a)

The EUT was configured as for effective radiated power as described in Section 9 of this report.

Tests were performed to identify the maximum effective radiated power (ERP).

Results:

Channel	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	824.2	32.9	38.4	5.5	Complied
Middle	836.4	30.8	38.4	7.6	Complied
Top	848.8	31.0	38.4	7.4	Complied

7.2.4. Transmitter Occupied Bandwidth: Section 2.1049

The EUT was configured as for occupied bandwidth measurements as described in Section 9 of this report.

Tests were performed to identify the maximum bandwidth occupied by the fundamental frequency of the EUT.

Results:

Channel	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (kHz)
Bottom	824.2	3.0	10.0	244.008
Middle	836.4	3.0	10.0	242.885
Top	848.8	3.0	10.0	241.683

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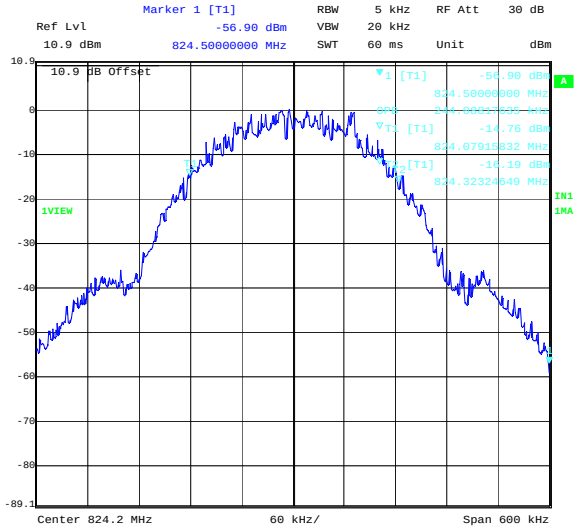
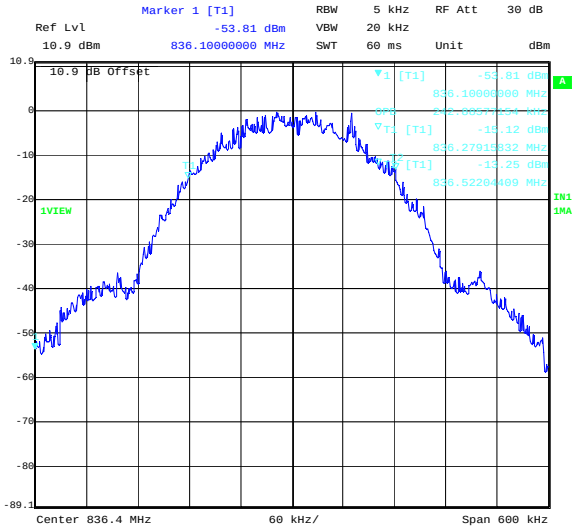
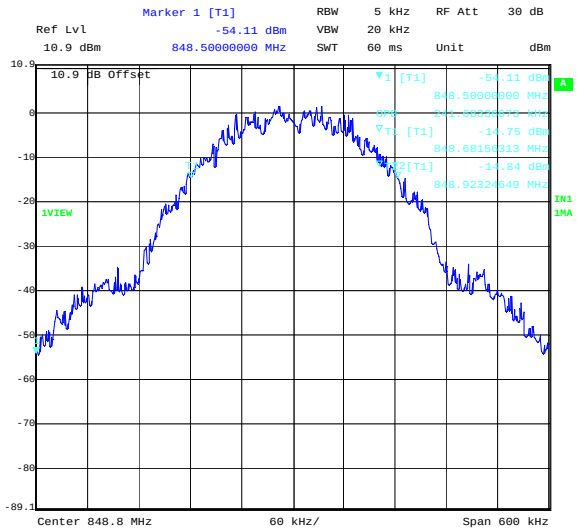
Transmitter Occupied Bandwidth: Section 2.1049 (Continued)



Title: 49304JD19 FCC PART 22
Comment A: OCCUPIED BANDWIDTH BOTTOM CHANNEL GSM850
Date: 11.DEC.2007 12:02:44



Title: 49304JD19 FCC PART 22
Comment A: OCCUPIED BANDWIDTH MID CHANNEL GSM850
Date: 11.DEC.2007 12:05:15



Title: 49304JD19 FCC PART 22
Comment A: OCCUPIED BANDWIDTH TOP CHANNEL GSM850
Date: 11.DEC.2007 12:07:25

Note: The occupied bandwidth is measured using the internal OBW function of the measurement analyser. The analyser automatically configures the measurement bandwidths to make an accurate measurement.
The results can be observed in the right hand corner of the graphs.

7.2.5. Transmitter Out of Band Radiated Emissions: Section 2.1053 & 22.917

The EUT was configured as for transmitter radiated emission measurements as described in Section 9 of this report.

Tests were performed to identify the maximum transmitter radiated emission levels.

Results:

Bottom Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1648.306	-38.5	-13.0	25.5	Complied

Middle Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1673.230	-39.1	-13.0	26.1	Complied

Top Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1697.647	-44.6	-13.0	31.6	Complied

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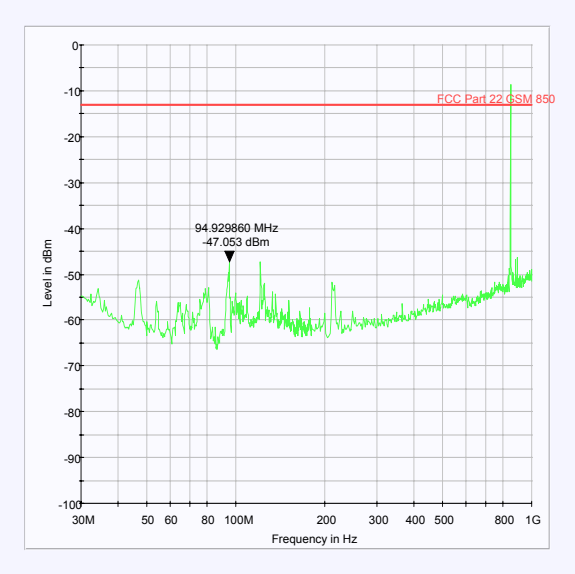
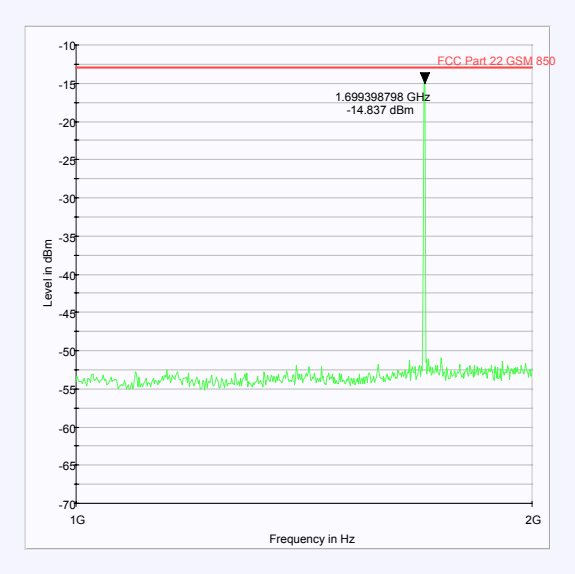
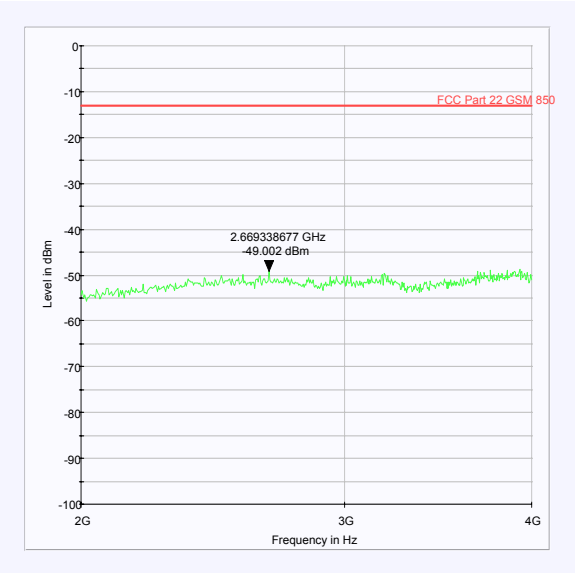
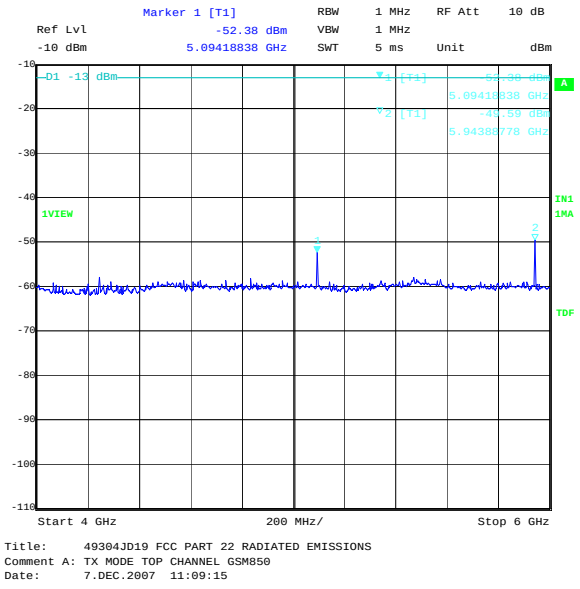
Transmitter Out of Band Radiated Emissions: Section 2.1053 & 22.917 (Continued)









Note: In band emissions are shown on some plots.

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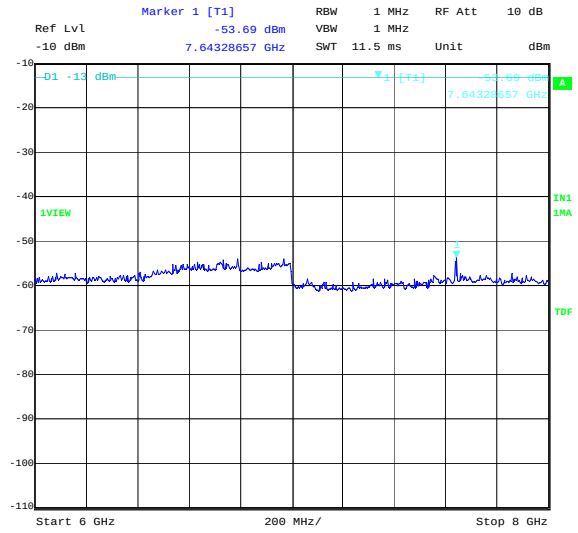
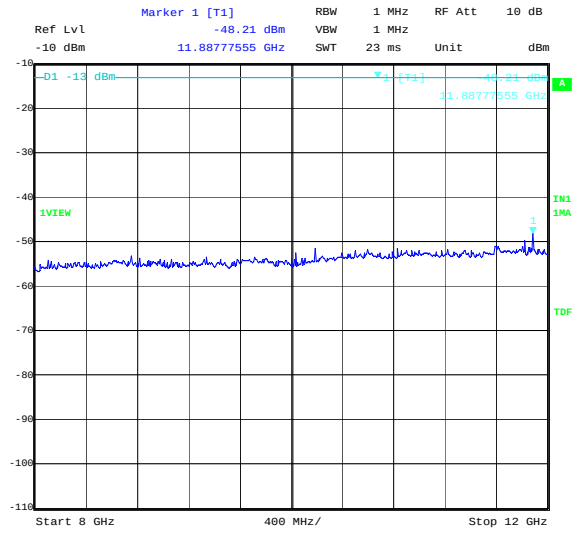
Transmitter Out of Band Radiated Emissions: Section 2.1053 & 22.917 (Continued)



Title: 49304JD19 FCC PART 22 RADIATED EMISSIONS
Comment A: TX MODE TOP CHANNEL GSM850
Date: 7.DEC.2007 11:12:49



Title: 49304JD19 FCC PART 22 RADIATED EMISSIONS
Comment A: TX MODE TOP CHANNEL GSM850
Date: 7.DEC.2007 11:24:34

Note: In band emissions are shown on some plots.

7.2.6. Transmitter Radiated Emissions at Band Edges: Section 2.1053/22.917

The EUT was configured as for transmitter radiated emission testing described in Section 9 of this report.

Tests were performed to identify the maximum emission level at the band edges of the frequency block that the EUT will operate over.

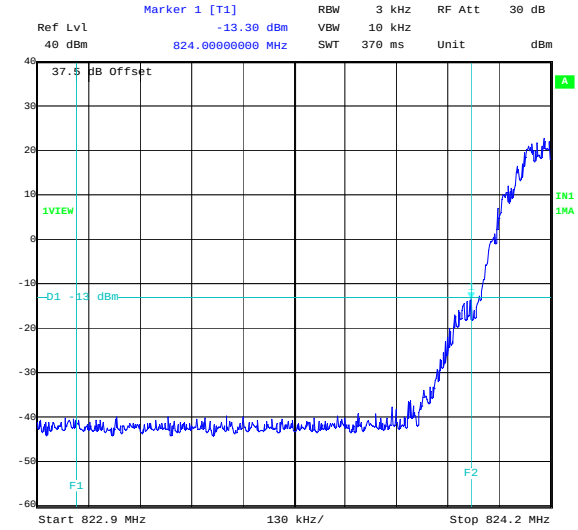
Results: (GSM850 Mode)

Bottom Band Edge

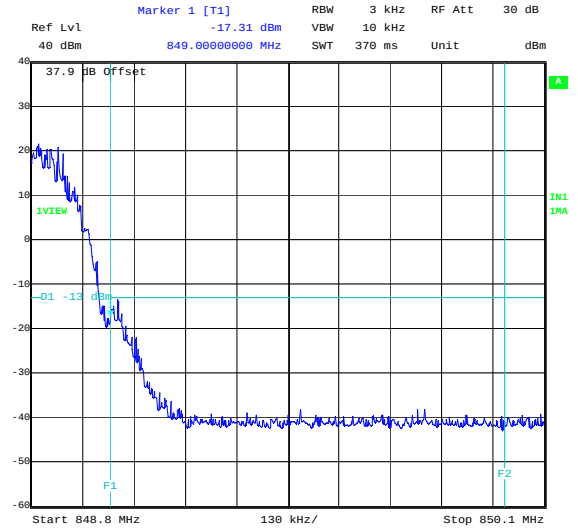
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-13.3	-13.0	0.3	Complied

Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
849	-17.3	-13.0	4.3	Complied



Title: 49304JD19 FCC PART 24
Comment A: TX RADIATED EMISSIONS LOWER BAND EDGE
Date: 11.DEC.2007 11:01:52



Title: 49304JD19 FCC PART 24
Comment A: TX RADIATED EMISSIONS UPPER BAND EDGE
Date: 11.DEC.2007 11:17:07

7.3. Test Results – FCC Part 24 and RSS-133 (GSM 1900 band)

7.3.1. Idle Mode Radiated Spurious Emissions: Section 15.109 - Electric Field Strength Measurements (Frequency Range: 30 to 1000 MHz)

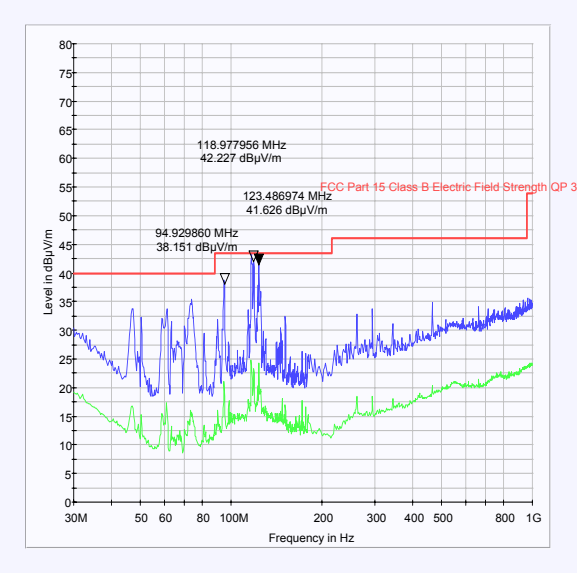
The EUT was configured as for receiver radiated emission - Part 24 testing as described in Section 9 of this report.

Tests were performed to identify the maximum receiver or standby radiated emission levels.

Results:

Frequency (MHz)	Antenna Polarity	Quasi Peak Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
94.929	Vertical	38.2	43	4.8	Complied
118.741	Vertical	42.2	43	0.8	Complied
123.486	Vertical	41.6	43	1.4	Complied

Idle Mode Radiated Spurious Emissions: Section 15.109 - Electric Field Strength Measurements (Frequency Range: 30 to 1000 MHz) (Continued)



7.3.2. Idle Mode Radiated Spurious Emissions: Section 15.109 - Electric Field Strength Measurements (Frequency Range: 1 to 10GHz)

Results:

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
3.871743	Vertical	52.8	-6.2	46.6	54.0	7.4	Complied

Note(s):

1. *No spurious emissions were detected above the noise floor of the measuring receiver; therefore, the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.*

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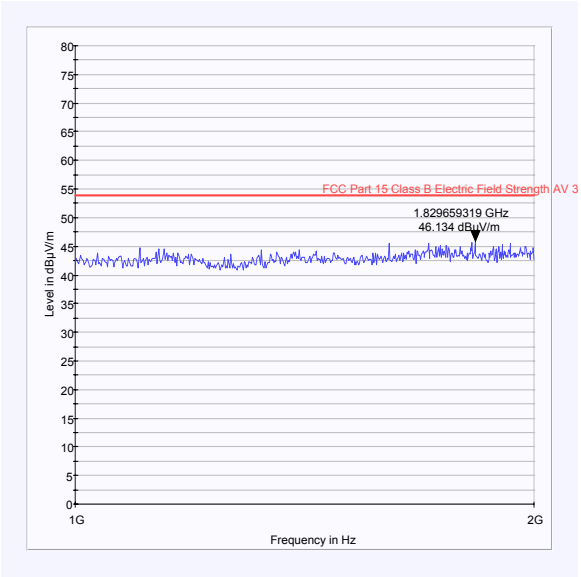
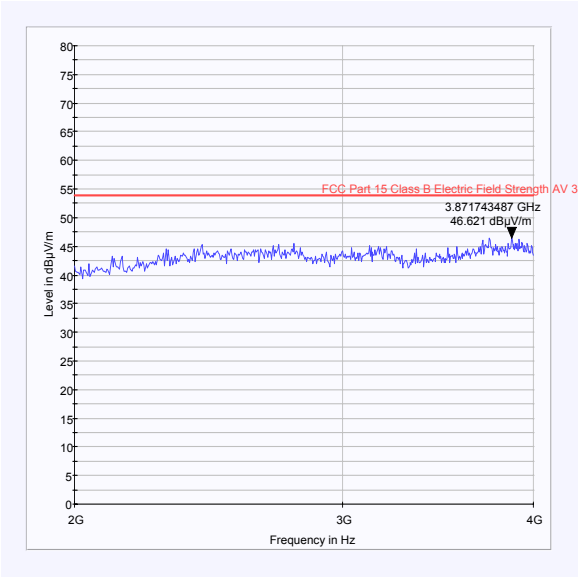
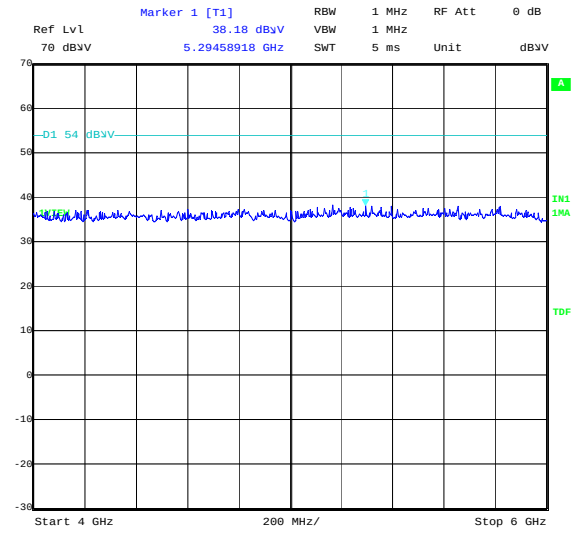
Idle Mode Radiated Spurious Emissions: Section 15.109 - Electric Field Strength Measurements (Frequency Range: 1 to 10 GHz) (Continued)







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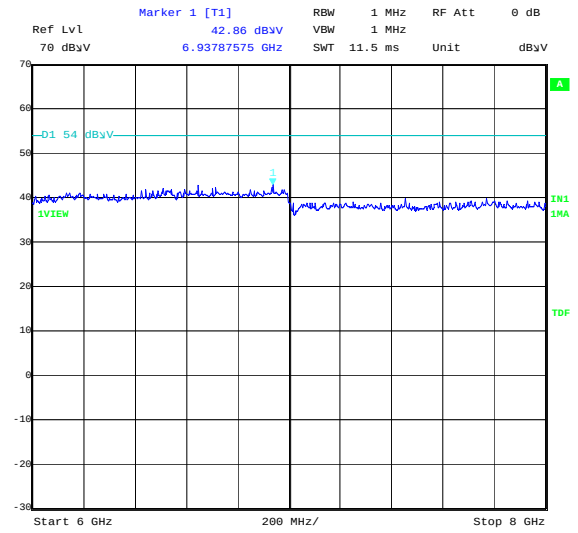
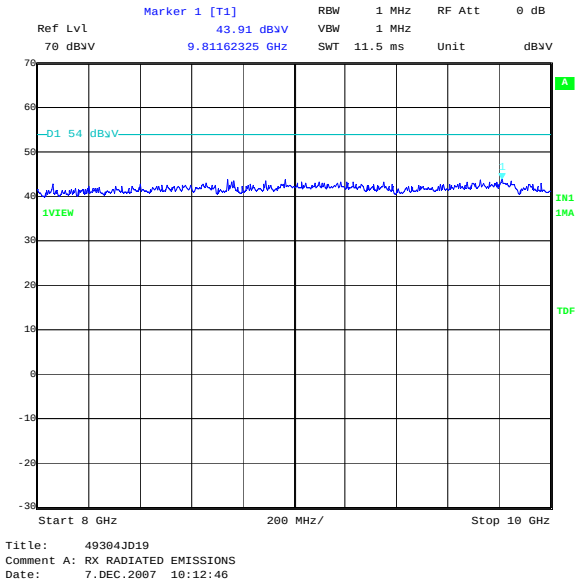
Date: 7.DEC.2007 09:57:18



Title: 49304JD19
Comment A: RX RADIATED EMISSIONS
Date: 7.DEC.2007 10:04:25

Test of: Ericsson AB
FWT G30a
To: FCC Part 22: 2007, FCC Part 24: 2007,
RSS-132 Issue 2 September 2005, RSS-133 Issue 2 June 2005
& RSS-Gen Issue 2 June 2007

Idle Mode Radiated Spurious Emissions: Section 15.109 - Electric Field Strength Measurements (Frequency Range: 1 to 10 GHz) (Continued)



7.3.3. Transmitter Effective Isotropic Radiated Power (EIRP): Section 24.232

The EUT was configured as for effective isotropic radiated power as described in Section 9 of this report.

Tests were performed to identify the maximum effective isotropic radiated power (EIRP).

Results:

Channel	Measured Frequency (MHz)	Antenna Polarity	Maximum Transmitter EIRP (dBm)	Limit EIRP (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	28.0	33.0	5.0	Complied
Middle	1879.8	Horizontal	28.1	33.0	4.9	Complied
Top	1909.8	Horizontal	28.7	33.0	4.3	Complied

7.3.4. Transmitter Occupied Bandwidth: Section 24.238

The EUT was configured as for occupied bandwidth measurements as described in Section 9 of this report.

Tests were performed to identify the maximum bandwidth occupied by the fundamental frequency of the EUT.

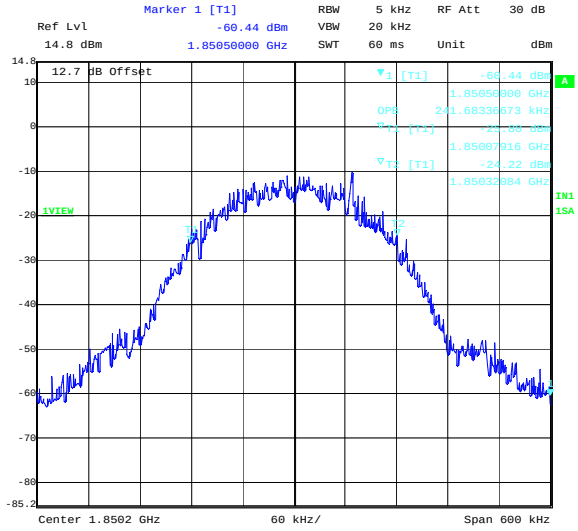
Results:

Channel	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	3.0	10.0	241.683
Middle	1879.8	3.0	10.0	244.088
Top	1909.8	3.0	10.0	247.695

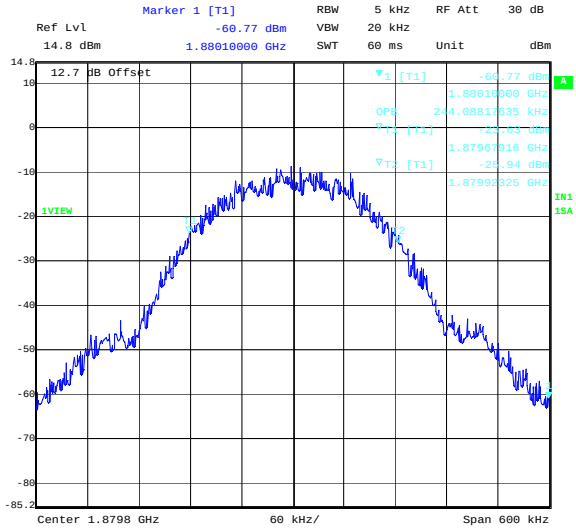
Test of: Ericsson AB
FWT G30a

To: FCC Part 22: 2007, FCC Part 24: 2007,
RSS-132 Issue 2 September 2005, RSS-133 Issue 2 June 2005
& RSS-Gen Issue 2 June 2007

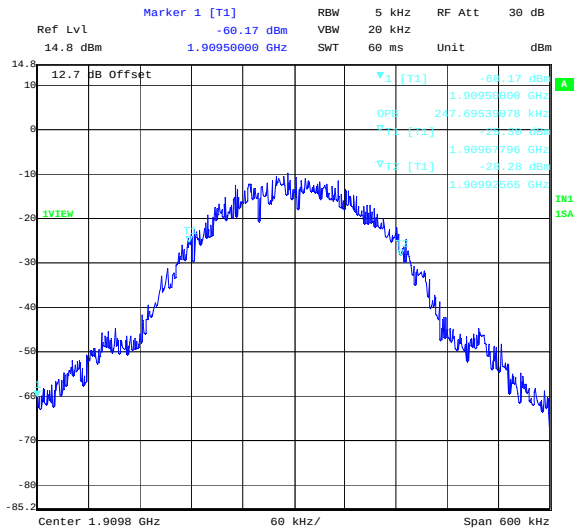
Transmitter Occupied Bandwidth: Section 24.238 (Continued)



Title: 49304JD19 FCC PART 24
Comment A: OCCUPIED BANDWIDTH BOTTOM CHANNEL GSM1900
Date: 11.DEC.2007 15:47:03



Title: 49304JD19 FCC PART 24
Comment A: OCCUPIED BANDWIDTH MID CHANNEL GSM1900
Date: 11.DEC.2007 15:45:12



Title: 49304JD19 FCC PART 24
Comment A: OCCUPIED BANDWIDTH TOP CHANNEL GSM1900
Date: 11.DEC.2007 15:41:03

7.3.5. Transmitter Out of Band Radiated Emissions: Section 2.1053 & 24.238

The EUT was configured as for transmitter radiated emission - Part 24 testing as described in Section 9 of this report.

Tests were performed to identify the maximum transmitter radiated emission levels.

Results:

Bottom Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
7402.805	-38.5	-13.0	25.5	Complied

Middle Channel

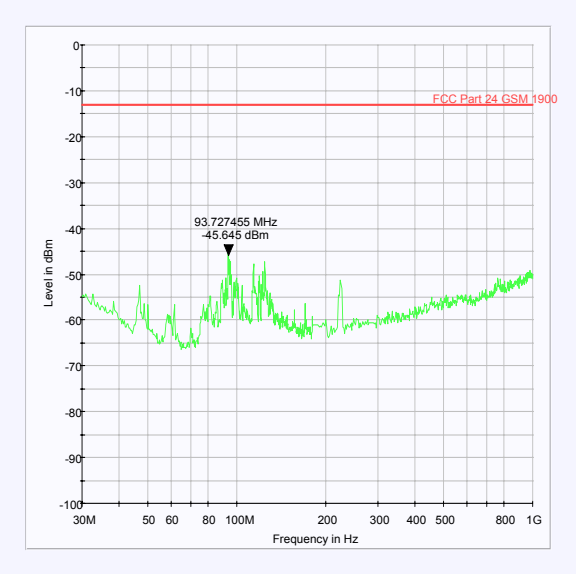
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
7523.046	-42.1	-13.0	29.1	Complied

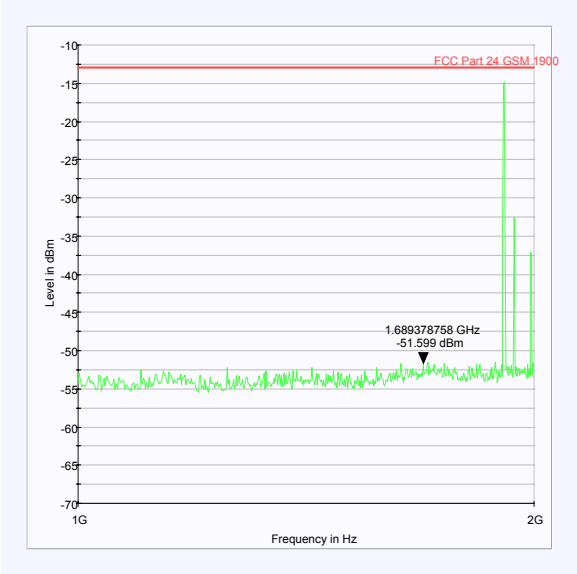
Top Channel

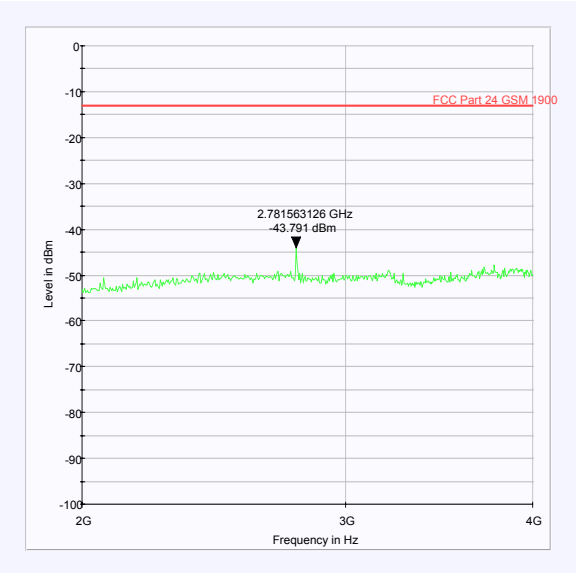
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
7639.278	-43.7	-13.0	30.4	Complied

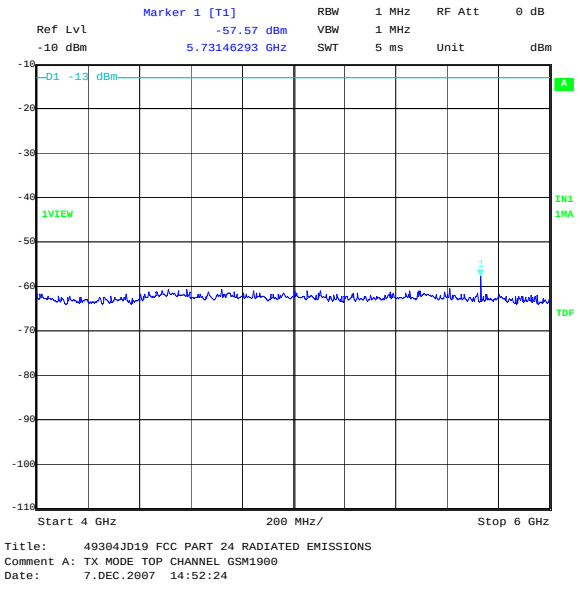
Test of: **Ericsson AB**
FWT G30a
To: **FCC Part 22: 2007, FCC Part 24: 2007,**
RSS-132 Issue 2 September 2005, RSS-133 Issue 2 June 2005
& RSS-Gen Issue 2 June 2007

Transmitter Out of Band Radiated Emissions: Section 2.1053 & 24.238 (Continued)







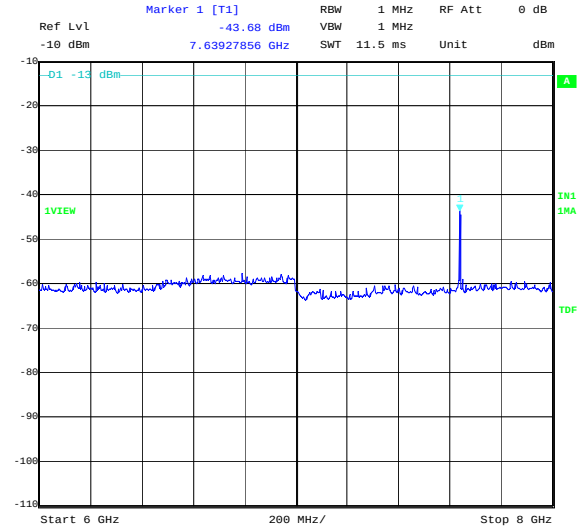


Note: In band emissions are shown on some plots.

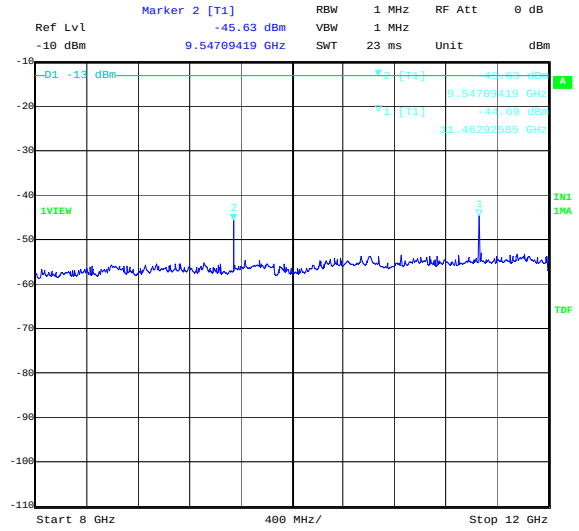
Test of: Ericsson AB
FWT G30a

To: FCC Part 22: 2007, FCC Part 24: 2007,
RSS-132 Issue 2 September 2005, RSS-133 Issue 2 June 2005
& RSS-Gen Issue 2 June 2007

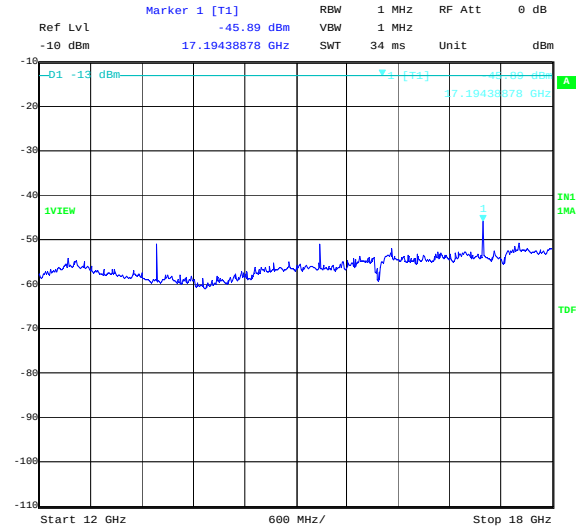
Transmitter Out of Band Radiated Emissions: Section 2.1053 & 24.238 (Continued)



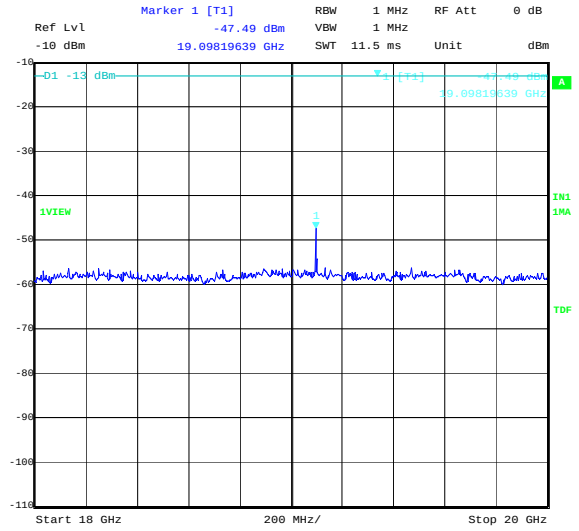
Title: 49304JD19 FCC PART 24 RADIATED EMISSIONS
Comment A: TX MODE TOP CHANNEL GSM1900
Date: 7.DEC.2007 15:06:08



Title: 49304JD19 FCC PART 24 RADIATED EMISSIONS
Comment A: TX MODE TOP CHANNEL GSM1900
Date: 7.DEC.2007 15:09:39



Title: 49304JD19 FCC PART 24 RADIATED EMISSIONS
Comment A: TX MODE TOP CHANNEL GSM1900
Date: 7.DEC.2007 15:21:33



Title: 49304JD19 FCC PART 24 RADIATED EMISSIONS
Comment A: TX MODE TOP CHANNEL GSM1900
Date: 7.DEC.2007 15:25:05

Note: In band emissions are shown on some plots.

Transmitter Out of Band Radiated Emissions: Section 2.1053 & 24.238 (Continued)

Integrated Power Over 1 MHz Strip Band: 1911 to 1912 MHz

1st 1 MHz block immediately outside adjacent frequency block

100 kHz Strip Number	Peak Power (nW/100 kHz)	100 kHz Strip Number	Peak Power (nW/100 kHz)
1	4169	6	4571
2	4365	7	4074
3	3981	8	4365
4	5129	9	4786
5	3715	10	3548
Total Peak Power:	42703 nW/MHz		

Integrated Power Over 1 MHz Strip Band: 1912 to 1913 MHz

2nd 1 MHz block immediately outside adjacent frequency block

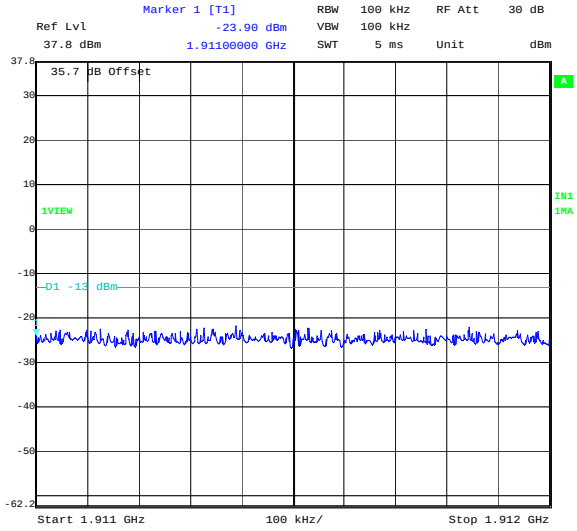
100 kHz Strip Number	Peak Power (nW/100 kHz)	100 kHz Strip Number	Peak Power (nW/100 kHz)
1	4571	6	4169
2	3631	7	4571
3	4677	8	4365
4	3311	9	4571
5	4266	10	3467
Total Peak Power:	41599 nW/MHz		

Results:

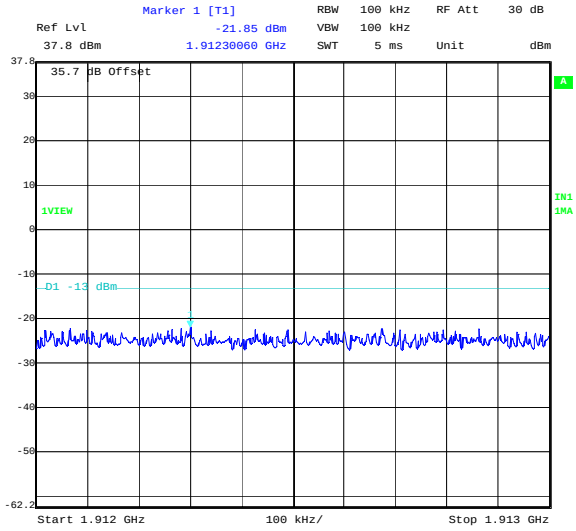
Band (MHz)	Peak Power (nW/MHz)	Peak Power (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Status
1911 to 1912	42703	-13.7	-13.0	0.7	Complied
1912 to 1913	41599	-13.8	-13.0	0.8	Complied

Test of: Ericsson AB
FWT G30a
To: FCC Part 22: 2007, FCC Part 24: 2007,
RSS-132 Issue 2 September 2005, RSS-133 Issue 2 June 2005
& RSS-Gen Issue 2 June 2007

Transmitter Out of Band Radiated Emissions: Section 2.1053 & 24.238 (Continued)



Title: 49304JD19 FCC PART 24
Comment A: TX RADIATED EMISSIONS UPPER BAND EDGE GSM 1900
Date: 11.DEC.2007 15:28:31



Title: 49304JD19 FCC PART 24
Comment A: TX RADIATED EMISSIONS UPPER BAND EDGE GSM 1900
Date: 11.DEC.2007 15:32:18

7.3.6. Transmitter Radiated Emissions at Band Edges: Section 2.1053 & 24.238

The EUT was configured as for transmitter radiated emissions – Part 24 testing described in Section 9 of this report.

Tests were performed to identify the maximum emissions level at the band edges of the frequency block that the EUT will operate over.

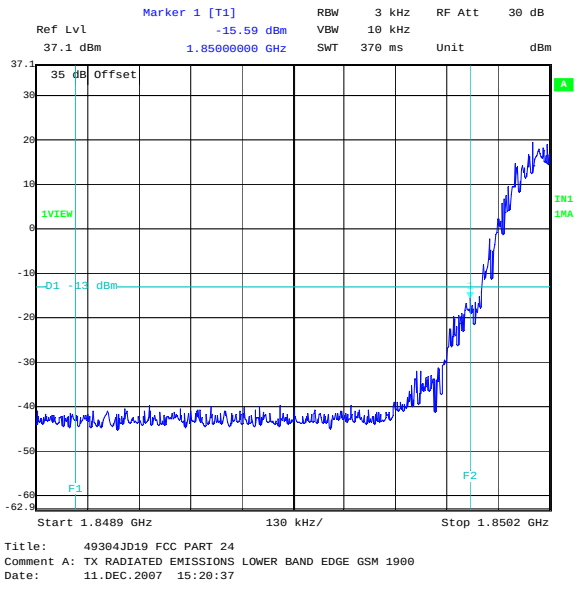
Results: (GSM Mode)

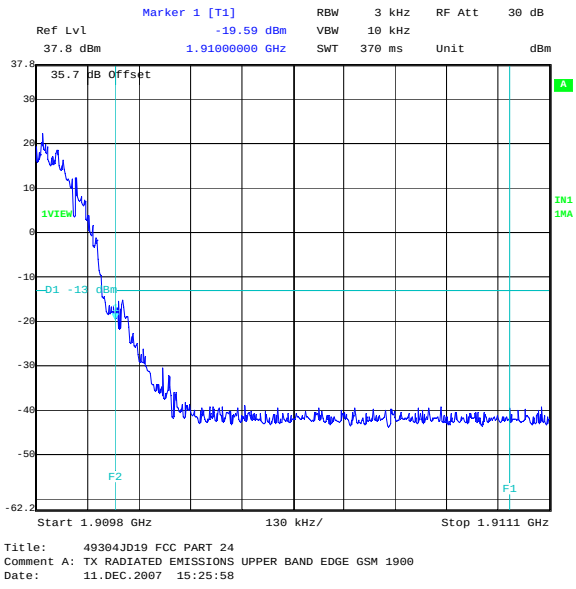
Bottom Band Edge

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-15.6	-13.0	2.6	Complied

Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-19.6	-13.0	6.6	Complied





8. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor, such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
Effective Radiated Power (ERP)	Not applicable	95%	+/- 1.78 dB
Occupied Bandwidth	Not applicable	95%	+/- 0.12 %
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	+/- 5.26 dB
Radiated Spurious Emissions	1 GHz to 20 GHz	95%	+/- 1.78 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the appropriate accreditation body is followed.

9. Measurement Methods

9.1. Receiver Radiated Emissions

Radiated emissions measurements were performed in accordance with the standard, against appropriate limits for each detector function.

Initial pre-scans covering the entire measurement band from the lowest generated frequency declared up to the upper frequency detailed in Section 15.33(b) were performed within a screened chamber in order to identify frequencies on which the EUT was generating interference. This determined the frequencies from the EUT, which required further examination. In order to minimise the time taken for the swept measurements, a peak detector was used in conjunction with the appropriate detector measuring bandwidth (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and for the duty cycle of the EUT.

The initial scans were performed using an antenna height of 1.5 m and a measurement distance of 3 m. A limit line was set to the specification limit. Levels within 20dB of this limit were measured where possible, on occasion; the receiver noise floor came within the 20dB boundary. On these occasions, the system noise floor may have been recorded.

An open area test site using the appropriate test distance and measuring receiver with a quasi peak detector was used for measurements below 1000 MHz, for measurements above 1000 MHz average and peak detectors were used.

For the final measurements the EUT was arranged on a non-conducting turn table on a standard test site compliant with ANSI C63.4 – 2003 Clause 5.4.

On the open area test site, at each frequency where a signal was found, the levels were maximised by initially rotating the turntable through 360° and then varying the antenna height between 1 m and 4 m in the horizontal polarisation. At this point, any signals found to be between the limit and a level 6 dB below it were further maximised by changing the configuration of the EUT, e.g. re-routing cables to peripherals and moving peripherals with respect to the EUT. The procedure was repeated for the vertical polarisation.

The final field strength was determined as the indicated level in dBμV plus cable loss and antenna factor.

The test equipment settings for radiated emissions measurements were as follows:

Receiver Function	Initial Scan	Final Measurements <1GHz	Final Measurements ≥1 GHz
Detector Type:	Peak	Quasi-Peak (CISPR)	Peak/Average
Mode:	Max Hold	Not applicable	Not applicable
Bandwidth:	(120 kHz <1GHz) (1MHz ≥1GHz)	120 kHz	1 MHz (If applicable)
Amplitude Range:	60 dB	20 dB	20 dB (typical)
Step Size:	Continuous sweep	Not applicable	Not applicable
Sweep Time:	Coupled	Not applicable	Not applicable

9.2. Effective Radiated Power (ERP) – FCC Part 22

ERP measurements were performed in accordance with the standard, against appropriate limits.

The ERP was measured with the EUT arranged on a non-conducting turntable on a standard test site compliant with ANSI C63.4 – 2003 Clause 5.4. The transmitter was fitted with an integral antenna; as such all radiated tests were performed with the unit operating into the integral antenna.

The level of the ERP was measured using a spectrum analyser.

The test antenna was positioned in the horizontal plane. The EUT was oriented in the X plane. The test antenna was then raised and lowered until a maximum peak was observed. The turntable was then rotated through 360 degrees and the maximum peak reading obtained. The height search was then repeated to take into consideration the new angular position of the turntable. The maximum reading observed was then recorded. This procedure was then repeated with the EUT oriented in the Y and Z planes. The highest reading taken in all 3 planes was recorded. The entire procedure was then repeated with the test antenna set in the vertical polarity.

Once the final amplitude (maximised) had been obtained, the EUT was substituted with a substitution antenna. For ERP measurements a dipole antenna was used. The centre of the substitution antenna was set to approximately the same centre location as the EUT. The substitution antenna was set to the horizontal polarity. The substitution antenna was matched into a signal generator using a 6 dB or greater attenuator. The signal generator was tuned to the EUT's frequency under test.

The test antenna was then raised and lowered to obtain a maximum reading on the spectrum analyser. The level of the signal generator output was then adjusted until the maximum recorded EUT level was observed. The signal generator level was noted. This procedure was repeated with both test antenna and substitution antenna vertically polarised. The ERP was calculated as:-

ERP = Signal Generator Level - Cable Loss + Antenna Gain

Effective Radiated Power (ERP) (Continued)

Circumstances where the signal generator could not produce the desired power, substitutions were performed with the signal generator set to 0 dBm. The radiated signal was maximised as previously described. The level indicated on the measuring receiver was noted. The delta between this level and the maximum level for the EUT was calculated and also noted. The ERP of the signal generator was calculated using the above formulae. The recorded delta was added to the calculated ERP to obtain the substituted EUT ERP.

Delta (dB) = EUT – SG

Where:

EUT = spectrum analyser indicated EUT raw level

SG = spectrum analyser indicated signal generator raw level

The signal generator actual ERP is calculated as:

ERP SG= Signal Generator Level - Cable Loss + Antenna Gain

The EUT ERP is calculated as:

ERP EUT = ERP SG + Delta.

The test equipment settings for ERP measurements were as follows:

Receiver Function	Setting
Detector Type:	Peak
Mode:	Not applicable
Bandwidth:	≥ Emission Bandwidth
Amplitude Range:	100 dB
Sweep Time:	Coupled

9.3. Effective Isotropic Radiated Power (EIRP) – FCC Part 24

EIRP measurements were performed in accordance with the standard, against appropriate limits.

The EIRP was measured with the EUT arranged on a non-conducting turn table on a standard test site compliant with ANSI C63.4 – 2003 Clause 5.4. The transmitter was fitted with an integral antenna; therefore all radiated tests were performed with the unit operating into the integral antenna.

The level of the EIRP was measured using a spectrum analyser.

The test antenna was positioned in the horizontal plane. The EUT was oriented in the X plane. The test antenna was then raised and lowered until a maximum peak was observed. The turntable was then rotated through 360 degrees and the maximum peak reading obtained. The height search was then repeated to take into consideration the new angular position of the turntable. The maximum reading observed was then recorded. This procedure was then repeated with the EUT oriented in the Y and Z planes. The highest reading taken in all 3 planes was recorded. The entire procedure was then repeated with the test antenna set in the vertical polarity.

Once the final amplitude (maximised) had been obtained, the EUT was substituted with a substitution antenna. For EIRP measurements a Horn antenna whose gain was based on an isotropic antenna was used, ERP measurements were done using a dipole. The centre of the substitution antenna was set to approximately the same centre location as the EUT. The substitution antenna was set to the horizontal polarity. The substitution antenna was matched into a signal generator using a 6 dB or greater attenuator. The signal generator was tuned to the EUT's frequency under test.

The test antenna was then raised and lowered to obtain a maximum reading on the spectrum analyser. The level of the signal generator output was then adjusted until the maximum recorded EUT level was observed. The signal generator level was noted. This procedure was repeated with both test antenna and substitution antenna vertically polarised. The EIRP was calculated as:-

EIRP = Signal Generator Level - Cable Loss + Antenna Gain

All measurements were performed using broadband Horn antennas.

Effective Isotropic Radiated Power (EIRP) (Continued)

Circumstances where the signal generator could not produce the desired power, substitutions were performed with the signal generator set to 0 dBm. The radiated signal was maximised as previously described. The level indicated on the measuring receiver was noted. The delta between this level and the maximum level for the EUT was calculated and also noted. The EIRP of the signal generator was calculated using the above formulae. The recorded delta was added to the calculated EIRP to obtain the substituted EUT EIRP.

Delta (dB) = EUT – SG

Where:

EUT = spectrum analyser indicated EUT raw level

SG = spectrum analyser indicated signal generator raw level

The signal generator actual EIRP is calculated as:

EIRP SG= Signal Generator Level - Cable Loss + Antenna Gain

The EUT EIRP is calculated as:

EIRP EUT = EIRP SG + Delta.

The test equipment settings for EIRP measurements were as follows:

Receiver Function	Setting
Detector Type:	Peak
Mode:	Not applicable
Bandwidth:	1 MHz
Amplitude Range:	100 dB
Sweep Time:	Coupled

9.4. Occupied Bandwidth

The EUT was connected to a spectrum analyser enabled with an occupied bandwidth function and a GSM test set via a bi-directional coupler to its antenna port.

Measurements were performed to determine the occupied bandwidth in accordance with FCC Part 2.1049. The occupied bandwidth was measured from the fundamental emission at the bottom, middle and top channels.

As the EUT is a PCS phone, no modulation input port was available. A call was thus set up using the PCS/GSM simulator and using normal modulation. The Occupied Bandwidth was measured in this configuration.

The occupied bandwidth was measured using the built in occupied bandwidth function of the Rohde and Schwarz FSEB or ESIB spectrum analyser. It was set to measure the bandwidth where 99% of the signal power was contained. The analyser settings were set as per those outlined in the spectrum analyser user manual for this measurement, i.e., RBW $\geq$ 1% of occupied bandwidth. A value of 3 kHz was used.

9.5. Transmitter Radiated Emissions – FCC Part 22

Radiated emission measurements were performed in accordance with the standard, against appropriate limits for each detector function.

Initial pre-scans covering the entire measurement band from the lowest generated frequency declared up to 10 times the highest fundamental frequency. The scans were performed within a screened chamber in order to identify frequencies on which the EUT was generating spurious. This procedure identified the frequencies from the EUT, which required further examination. Repetitive scans were performed to allow for emissions with low repetition rates, and for the duty cycle of the EUT.

The initial scans were performed using an antenna height of 1.5 m and a measurement distance of 3 m. A limit line was set to the specification limit by characterising the screen room using a known signal source set at exactly the same location as the EUT. The signal source was derived from either a horn antenna or a dipole dependant on the frequency band under investigation. Any levels within 20 dB of this limit were measured where possible, on occasion; the receiver noise floor came within the 20 dB boundary. On these occasions, the system noise floor may have been recorded.

An open area test site using the appropriate test distance and measuring receiver with a peak detector was used for final measurements at each frequency recorded in the screen room.

The levels were maximised by initially rotating the turntable through 360° and then varying the antenna height between 1 m and 4 m in the vertical polarisation. At this point, any signals found to be between the limit and a level 6 dB below it were further maximised by changing the configuration of the EUT, e.g. re-routing cables to peripherals and moving peripherals with respect to the EUT. The procedure was repeated for the horizontal polarisation.

Once the final amplitude (maximised) had been obtained, the EUT was substituted with a substitution antenna. For EIRP measurements a horn antenna whose gain was based on an isotropic antenna was used, ERP measurements were done using a dipole. The centre of the substitution antenna was set to approximately the same centre location as the EUT. The substitution antenna was set to the horizontal polarity. The substitution antenna was matched into a signal generator using a 6 dB or greater attenuator. The signal generator was tuned to the EUT's frequency under test.

The test antenna was then raised and lowered to obtain a maximum reading on the spectrum analyser. The level of the signal generator output was then adjusted until the maximum recorded EUT level was observed. The signal generator level was noted. This procedure was repeated with both test antenna and substitution antenna vertically polarised. The radiated power was calculated as:-

EIRP/ERP = Signal Generator Level - Cable Loss + Antenna Gain

Transmitter Radiated Emissions (Continued)

The limit in the standard states that emissions shall be attenuated by at least 43+10 log (P) dB below the transmitter power (P), where (P) is the maximum measured fundamental power for the channel under test. This limit always reduces to -13dBm therefore, the limit line presented on the accompanying plots is set to -13dBm.

Any spurious measured were then compared to the -13dBm limit. The requirement is for the emission to be less than -13dBm. The margin between emission and limit is recorded and should always be positive to indicate compliance.

It should be noted that FCC Part 22.917 states that the 1st MHz band immediately adjacent to the applicants declared frequency block may be measured using a resolution bandwidth of at least 1% of the emission bandwidth. This bandwidth was found by calculating 1% of the bandwidth measured in the transmitter occupied bandwidth Section of this report. The next largest available bandwidth above this calculated figure was, therefore, used i.e. 3 kHz.

9.6. Transmitter Radiated Emissions – FCC Part 24

Radiated emission measurements were performed in accordance with the standard, against appropriate limits for each detector function.

Initial pre-scans covering the entire measurement band from the lowest generated frequency declared up to 10 times the highest fundamental frequency. The scans were performed within a screened chamber in order to identify frequencies on which the EUT was generating spurious. This procedure identified the frequencies from the EUT, which required further examination. Repetitive scans were performed to allow for emissions with low repetition rates, and for the duty cycle of the EUT.

The initial scans were performed using an antenna height of 1.5 m and a measurement distance of 3 m. A limit line was set to the specification limit by characterising the screen room using a known signal source set at exactly the same location as the EUT. The signal source was derived from either a horn antenna or a dipole dependant on the frequency band under investigation. Any levels within 20 dB of this limit were measured where possible, on occasion; the receiver noise floor came within the 20 dB boundary. On these occasions, the system noise floor may have been recorded.

An open area test site using the appropriate test distance and measuring receiver with a peak detector was used for final measurements at each frequency recorded in the screen room.

The levels were maximised by initially rotating the turntable through 360° and then varying the antenna height between 1 m and 4 m in the vertical polarisation. At this point, any signals found to be between the limit and a level 6 dB below it were further maximised by changing the configuration of the EUT, e.g. re-routing cables to peripherals and moving peripherals with respect to the EUT. The procedure was repeated for the horizontal polarisation.

Once the final amplitude (maximised) had been obtained, the EUT was substituted with a substitution antenna. For EIRP measurements a Horn antenna whose gain was based on an isotropic antenna was used, ERP measurements were done using a dipole. The centre of the substitution antenna was set to approximately the same centre location as the EUT. The substitution antenna was set to the horizontal polarity. The substitution antenna was matched into a signal generator using a 6 dB or greater attenuator. The signal generator was tuned to the EUT's frequency under test.

The test antenna was then raised and lowered to obtain a maximum reading on the spectrum analyser. The level of the signal generator output was then adjusted until the maximum recorded EUT level was observed. The signal generator level was noted. This procedure was repeated with both test antenna and substitution antenna vertically polarised. The EIRP was calculated as:-

EIRP = Signal Generator Level - Cable Loss + Antenna Gain

The limit in the standard states that emissions shall be attenuated by at least 43+10 log (P) dB below the transmitter power (P), where (P) is the maximum measured fundamental power for the channel under test. This limit always reduces to -13 dBm therefore; the limit line presented on the accompanying plots is set to -13 dBm.

Transmitter Radiated Emissions (Continued)

Any spurious measured were then compared to the -13 dBm limit. The requirement is for the emission to be less than -13 dBm. The margin between emission and limit is recorded and should always be positive to indicate compliance.

All measurements were performed using broadband horn antennas.

It should be noted that FCC Part 24.238 states that the 1st MHz band immediately adjacent to the applicants declared frequency block may be measured using a resolution bandwidth of at least 1% of the emission bandwidth. This bandwidth was found by calculating 1% of the bandwidth measured in the transmitter occupied bandwidth Section of this report. The next largest available bandwidth above this calculated figure was, therefore, used i.e. 3 kHz.

The measurements in the 2nd and 3rd 1 MHz blocks away from the adjacent 1 MHz block from 1911 MHz to 1912 MHz and 1912 MHz to 1913 MHz were carried out using an analyser span of 1 MHz and a 100 kHz receiver resolution bandwidth (RBW). 10 linear readings were taken for each 100 kHz strip across the 1 MHz band. These readings were integrated to give the emission level in an equivalent 1 MHz bandwidth.

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A028	Antenna	Eaton	91888-2	304	08 Jun 2006	36
A031	Antenna	Eaton	91889-2	557	08 Jun 2006	36
A057	High Pass Filter	AERIAL FACILITIES LTD	HP-950-5N	4389B	Calibration not required	-
A1534	Pre Amplifier	Hewlett Packard	8449B OPT H02	3008A00405	Calibrated before use	-
A253	Antenna	Flann Microwave	12240-20	128	17 Nov 2006	36
A254	Antenna	Flann Microwave	14240-20	139	17 Nov 2006	36
A255	Antenna	Flann Microwave	16240-20	519	17 Nov 2006	36
A256	Antenna	Flann Microwave	18240-20	400	17 Nov 2006	36
A259	Antenna	Chase	CBL6111	1513	13 Mar 2007	12
A436	Antenna	Flann Microwave	20240-20	330	24 Apr 2006	36
C1155	Cable	Huber & Suhner	Sucoflex 104PA	1522/4PA	Calibrated before use	-
C1165	Cable	Rosenberger Micro-Coax	FA210A102 0007070	43189-1	Calibrated before use	-
C1167	Cable	Rosenberger Micro-Coax	FA210A103 0007070	43190-01	Calibrated before use	-
C151	Cable	Rosenberger	UFA210A-1-1181-70x70	None	Calibrated before use	-
C160	Cable	Rosenberger	UFA210A-1-1181-70x70	None	Calibrated before use	-
C348	Cable	Rosenberger	UFA210A-1-1181-70x70	2993	Calibrated before use	-
C461	Cable	Rosenberger	UFA210A-1-1182-704704	98H0305	Calibrated before use	-
M023	Test Receiver	Rohde & Schwarz	ESVP	872 991/027	24 Apr 2007	12

Test Equipment Used (Continued)

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
M024	Spectrum Monitor	Rohde & Schwarz	EZM	873 952/006	Calibrated before use	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	20 Dec 2006	12
M1140	Radio Communications Analyser	Anritsu	MT8820A	6K0000647	Calibration not required	-
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	25 Jan 2007	12
S201	Open Area Test Site	RFI	1	None	25 May 2007	12
S202	Site 2	RFI	2	S202-15011990	Calibrated before use	-
S212	Emissions Screened Room	RFI	12	None	Calibrated before use	-

NB In accordance with UKAS requirements, all the measurement equipment is on a calibration schedule.

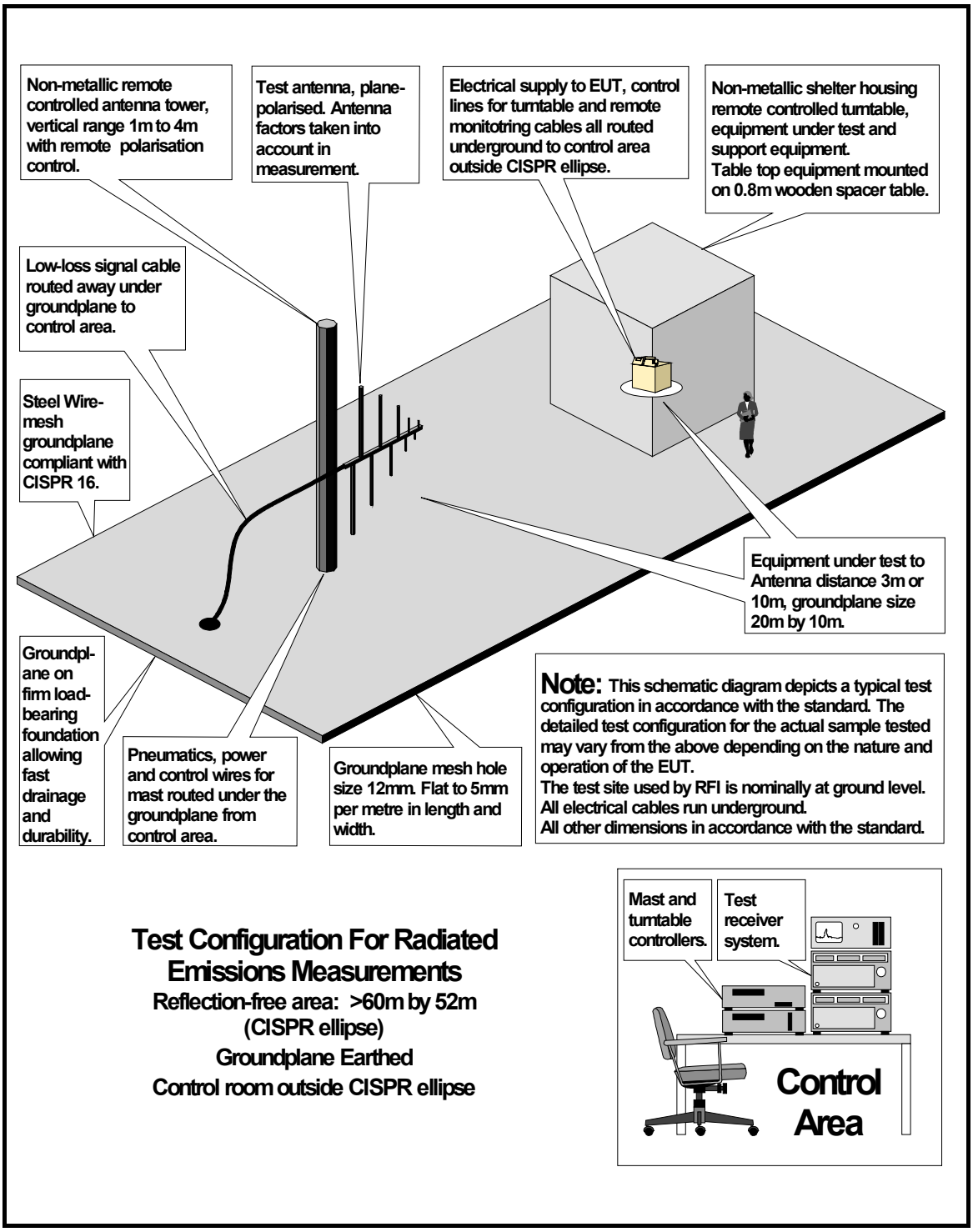
Appendix 2. Test Configuration Drawings

This appendix contains the following drawings:

Drawing Reference Number	Title
DRG\49304JD19\EMIRAD	Test configuration for measurement of radiated emissions.

Test of: Ericsson AB
FWT G30a
To: FCC Part 22: 2007, FCC Part 24: 2007,
RSS-132 Issue 2 September 2005, RSS-133 Issue 2 June 2005
& RSS-Gen Issue 2 June 2007

DRG\49304JD19\EMIRAD



Test Configuration For Radiated Emissions Measurements
Reflection-free area: >60m by 52m
(CISPR ellipse)
Groundplane Earthed
Control room outside CISPR ellipse