TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Ericsson Enterprise AB
Fixed Wireless Terminal - G32a

To: FCC Part 22: 2005 (Subpart H) and FCC Part 24: 2005 (Subpart E)

Test Report Serial No:
RFI/RPTE4/RP48122JD03A

Supersedes Test Report Serial No:
RFI/RPTE3/RP48122JD03A

This Test Report Is Issued Under The Authority Of Andrew Brown, Operations Manager: 	
Tested By: Steven Wong 	**Checked By: Tony Henriques** 
Report Copy No: PDF01	
Issue Date: 24 October 2006	**Test Dates: 28 April to 12 May and 10 July 2006**

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Table of Contents

1. Client Information

Company Name:	Ericsson Enterprise AB
Address:	S-126 25 Stockholm Sweden
Contact Name:	Mr 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)

Brand Name:	Flextronics
Model Name or Number:	Fixed Wireless Terminal G32a
Serial Number:	632A2920000652
Hardware Version:	00
Software Version:	00
FCC ID Number:	P5L-FWTG32
Country of Manufacture:	South Africa
Date of Receipt:	27 April 2006

Brand Name:	FRIWO (AC Adapter)
Model Name or Number:	None stated
Serial Number:	13
Country of Manufacture:	Not stated
Date of Receipt:	27 April 2006

2.2. 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 interface.

2.3. Modifications Incorporated in EUT

During the course of testing the EUT was not modified.

2.4. Support Equipment

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

Description:	Laptop PC
Brand Name:	Dell
Model Name or Number:	Latitude D610
Serial Number:	PC370NT
Cable Length and Type:	USB cable, 1.5m
Connected to Port:	USB Port

2.5. Additional Information Related to Testing

Power Supply Requirement:	Nominal 110 V, 60 Hz AC Mains supply Internal backup supply of 6 V
Intended Operating Environment:	Within GSM coverage
Equipment Category:	Transceiver, GSM 850 / GSM 1900
Type of Unit:	Base Station (fixed use)

FCC Part 22

Transmit Frequency Range:	842.2 MHz to 848.8 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	128	824.2
	Middle	190	836.6
	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	190	881.6
	Top	251	893.8
Maximum Power Output (ERP):	27.4 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	1960.0
	Top	810	1989.8
Maximum Power Output (EIRP):	29.6 dBm		

2.6. Port Identification

Port	Description
1.	Enclosure
2.	USB connector
3.	Ethernet connector
4.	Power supply connector
5.	Telephone connector
6.	SIM card holder
7.	Battery connector

3. Test Specification, Methods and Procedures

Reference:	FCC Part 22: 2005 Subpart H (Cellular Radiotelephone Service)
Title:	Code of Federal Regulations, Part 22 (47CFR22) Personal Communication Services.

Reference:	FCC Part 24: 2005 Subpart E (Broadband PCS)
Title:	Code of Federal Regulations, Part 24 (47CFR24) Personal Communication 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

None

5. Operation of the EUT during Testing

5.1. Operating Modes

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

Preliminary scans for radiated spurious emissions were performed on GSM, GPRS and EDGE mode. All testing and final measurements, with the exception of Band Edge measurements which were performed in all three modes of operations (GSM, GPPRS AND EDGE), were performed in GSM mode only, as it was identified to be the worst case mode of operation.

Transmitter Mode:

For carrier output power, occupied bandwidth and final radiated measurements, testing was performed at full power on top, middle and bottom channels of the assigned frequency block.

For frequency stability testing, measurements were performed at full power on the top, middle and bottom channels of the assigned frequency block at -30ºC through to +50ºC in 10º increments.

All transmitter radiated spurious pre-scan tests were performed at full power on the top channel of the assigned frequency block. Final measurements were then performed on the top, middle and bottom channels if an emission was identified.

Receiver/Idle Mode:

Testing was performed with the call terminated from the GSM Test Simulator and the phone left in Idle mode.

5.2. Configuration and Peripherals

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

Configured with the Ethernet and USB cables connected, the EUT was powered by an external 110 V AC Mains supply via the AC adaptor. A laptop was connected to the EUT via a USB cable. This was used to set the EUT into test mode. The laptop PC was then removed during testing.

6. Summary of Test Results

FCC Part 22

Range of Measurements	Specification Reference	Port Type	Compliancy Status
Receiver/Idle AC Conducted Spurious Emissions (150 kHz to 30 MHz)	C.F.R. 47 FCC Part 15: 2005 Section 15.107	AC Mains Input	Complied
Receiver/Idle Radiated Emissions	C.F.R. 47 FCC Part 15: 2005 Section 15.109	Enclosure	Complied
Transmitter Effective Radiated Power (ERP)	C.F.R. 47 FCC Part 22: 2005 Section 22.913(a)	Antenna	Complied
Transmitter Frequency Stability (Temperature Variation)	C.F.R. 47 FCC Part 22: 2005 Section 22.355	Antenna Terminals	Complied
Transmitter Frequency Stability (Voltage Variation)	C.F.R. 47 FCC Part 22: 2005 Section 22.355	Antenna Terminals	Complied
Transmitter Occupied Bandwidth	C.F.R. 47 FCC Part 22: 2005 Section 2.1049	Antenna Terminals	Complied
Transmitter Out of Band Radiated Emissions	C.F.R. 47 FCC Part 22: 2005 Section 2.1053/22.917	Antenna	Complied
Transmitter Band Edge Radiated Emissions	C.F.R. 47 FCC Part 22: 2005 Section 2.1053/22.917	Antenna	Complied

Summary of Test Results (Continued)

FCC Part 24

Range of Measurements	Specification Reference	Port Type	Compliancy Status
Idle Mode AC Conducted Spurious Emissions (150 kHz to 30 MHz)	C.F.R. 47 FCC Part 15: 2005 Section 15.107	AC Mains Input	Complied
Idle Mode Radiated Spurious Emissions	C.F.R. 47 FCC Part 15: 2005 Section 15.109	Enclosure	Complied
Transmitter Effective Isotropic Radiated Power (EIRP)	C.F.R. 47 FCC Part 24: 2005 Section 24.232	Antenna	Complied
Transmitter Frequency Stability (Temperature Variation)	C.F.R. 47 FCC Part 24: 2005 Section 24.235	Antenna Terminals	Complied
Transmitter Frequency Stability (Voltage Variation)	C.F.R. 47 FCC Part 24: 2005 Section 24.235	Antenna Terminals	Complied
Transmitter Occupied Bandwidth	C.F.R. 47 FCC Part 24: 2005 Section 24.238	Antenna Terminals	Complied
Transmitter Out of Band Radiated Emissions	C.F.R. 47 FCC Part 24: 2005 Section 2.1053/24.238	Antenna	Complied
Transmitter Band Edge Radiated Emissions	C.F.R. 47 FCC Part 2: 2005 Section 2.1053/24.238	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 (Subpart H)

7.2.1. Receiver/Idle Mode AC Conducted Spurious Emissions: Section 15.107

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

Tests were performed to identify the maximum emission levels present on the AC Mains line of the EUT.

Results:

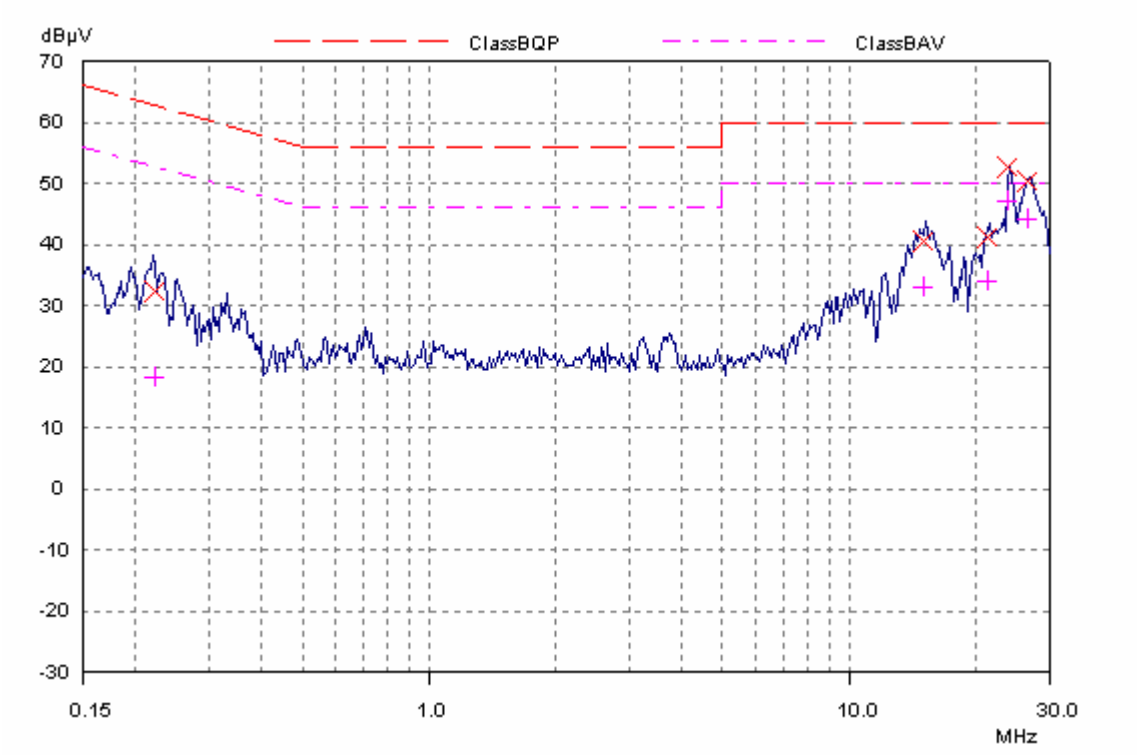
Quasi-Peak Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.22197	Live	32.28	62.74	30.46	Complied
15.07471	Neutral	40.43	60.00	19.57	Complied
21.30685	Live	41.14	60.00	18.86	Complied
23.92418	Live	52.52	60.00	7.48	Complied
26.69498	Live	50.33	60.00	9.67	Complied

Average Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.22197	Neutral	18.13	52.74	34.61	Complied
15.07471	Neutral	33.01	50.00	16.99	Complied
21.30685	Live	34.08	50.00	15.92	Complied
23.92418	Live	47.08	50.00	2.92	Complied
26.69498	Live	44.09	50.00	5.91	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions: Section 15.107 (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: 30 to 1000 MHz)

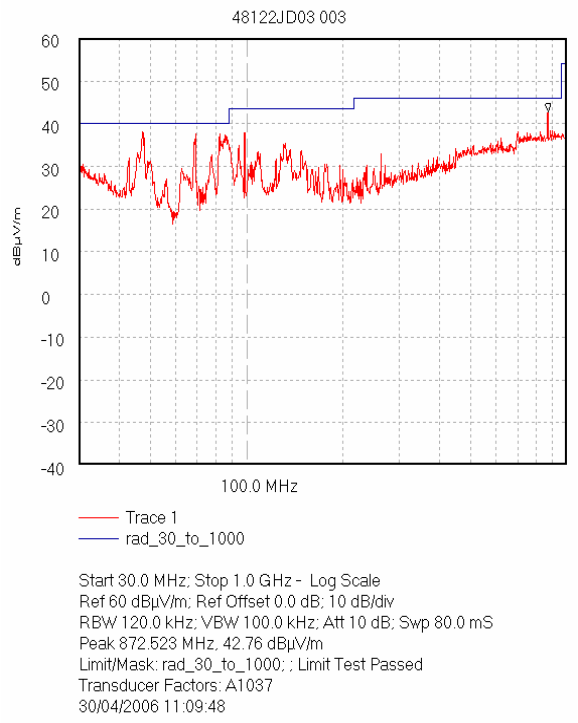
The EUT was configured as for radiated emission - Part 22 measurements as described in Section 9 of this report.

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
47.423	Vertical	25.1	40.0	14.9	Complied
69.066	Vertical	20.0	40.0	20.0	Complied
81.132	Vertical	18.3	40.0	21.7	Complied
130.311	Vertical	15.0	43.5	28.5	Complied
262.143	Vertical	22.3	46.0	23.7	Complied
869.118	Vertical	29.4	46.0	16.6	Complied

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.

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

Results:

Peak Level

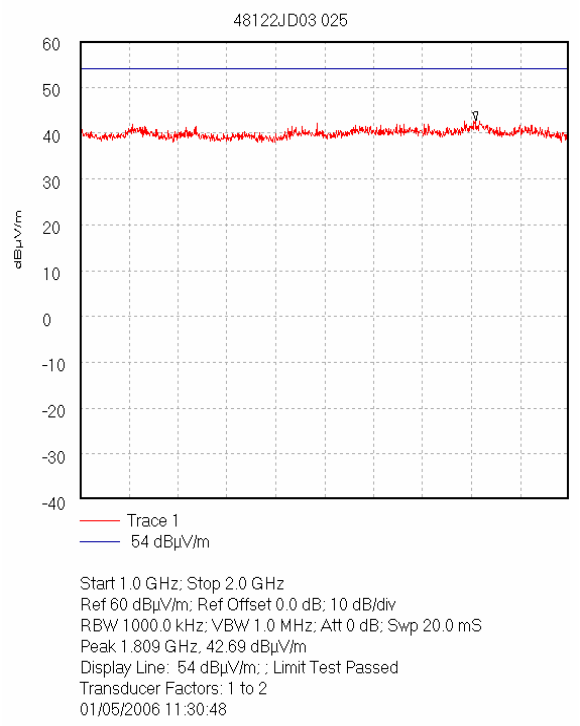
Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
4.7154	Vertical	32.0	-6.2	25.8	54.0	28.2	Complied

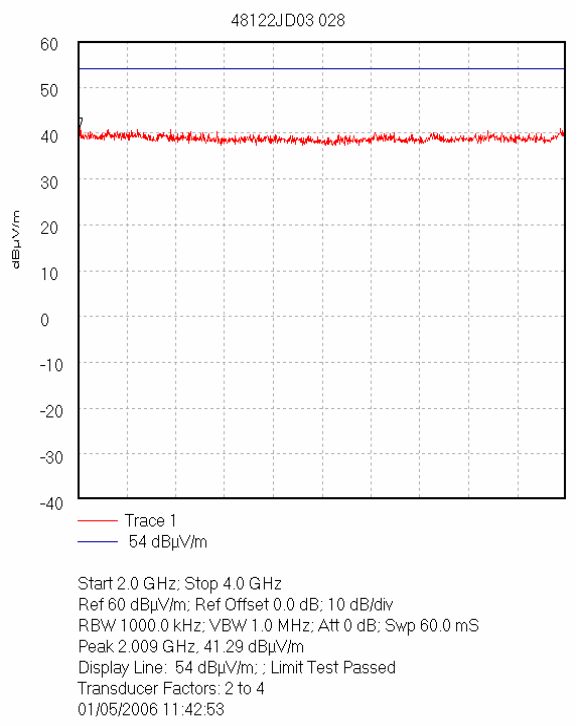
Note(s):

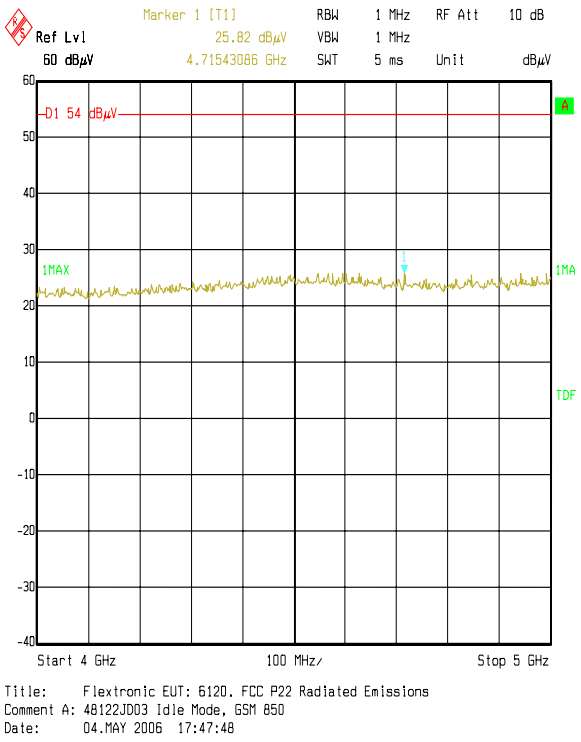
1. *The transducer factor incorporates the antenna factor, cables losses, pre-amplifier gain and attenuations*

2. *No emissions were found in the frequency range 1 GHz to 5 GHz and the level measured at 4.7154 GHz was that of the spectrum analyser's noise floor taken using a peak detector and compared to the average limit i.e. the worst case.*

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







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

7.2.4. 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	26.4	38.4	12.0	Complied
Middle	836.6	25.8	38.4	12.6	Complied
Top	848.8	27.4	38.4	11.0	Complied

7.2.5. Transmitter Frequency Stability (Temperature Variation): Section 22.355

The EUT was configured as for Part 2.1055 - frequency stability measurements as described in Section 9 of this report.

Tests were performed to identify the maximum frequency error of the EUT with variations in ambient temperature.

Results:

Bottom Channel (824.2 MHz)

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-30	824.199976	-24	0.290	2.5	2.471	Complied
-20	824.200010	10	0.010	2.5	2.488	Complied
-10	824.200012	12	0.020	2.5	2.485	Complied
0	824.199982	-18	0.022	2.5	2.478	Complied
10	824.199999	-1	0.001	2.5	2.499	Complied
20	824.200006	6	0.007	2.5	2.493	Complied
30	824.199995	-5	0.006	2.5	2.494	Complied
40	824.200011	11	0.013	2.5	2.487	Complied
50	824.200009	9	0.011	2.5	2.489	Complied

Transmitter Frequency Stability (Temperature Variation): Section 22.355 (Continued)

Results:

Top Channel (848.8 MHz)

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-30	848.799986	-14	0.016	2.5	2.484	Complied
-20	848.799988	-12	0.133	2.5	2.362	Complied
-10	848.799990	-10	0.012	2.5	2.488	Complied
0	848.800010	10	0.012	2.5	2.488	Complied
10	848.800000	0	0.000	2.5	2.500	Complied
20	848.799993	-7	0.008	2.5	2.492	Complied
30	848.799996	-4	0.005	2.5	2.495	Complied
40	848.800004	4	0.005	2.5	2.495	Complied
50	848.800001	1	0.001	2.5	2.499	Complied

7.2.6. Transmitter Frequency Stability (Voltage Variation): Section 22.355

The EUT was configured as for Part 2.1055 - frequency stability measurements as described in Section 9 of this report.

Tests were performed to identify the maximum frequency error of the EUT with variations in nominal operating voltage.

Results:

Bottom Channel (824.2 MHz)

Supply Voltage (V)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
93.5	824.200022	22	0.03	2.5	2.47	Complied
110	824.200026	26	0.03	2.5	2.47	Complied
126.5	824.200020	20	0.02	2.5	2.48	Complied

Top Channel (848.8 MHz)

Supply Voltage (V)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
93.5	848.800017	17	0.02	2.5	2.48	Complied
110	848.800016	16	0.02	2.5	2.48	Complied
126.5	848.800008	8	0.01	2.5	2.49	Complied

7.2.7. Transmitter Occupied Bandwidth: Section 2.1049

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

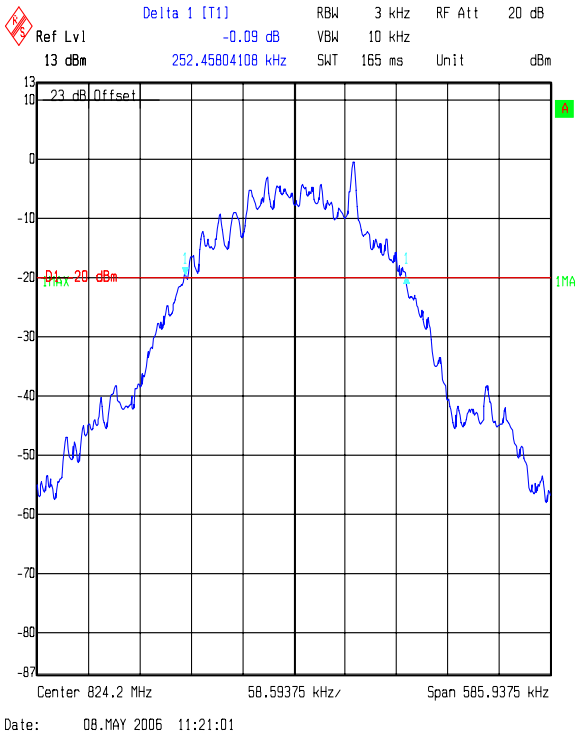
Tests were performed to identify the maximum bandwidth occupied by the fundamental frequency of the EUT.

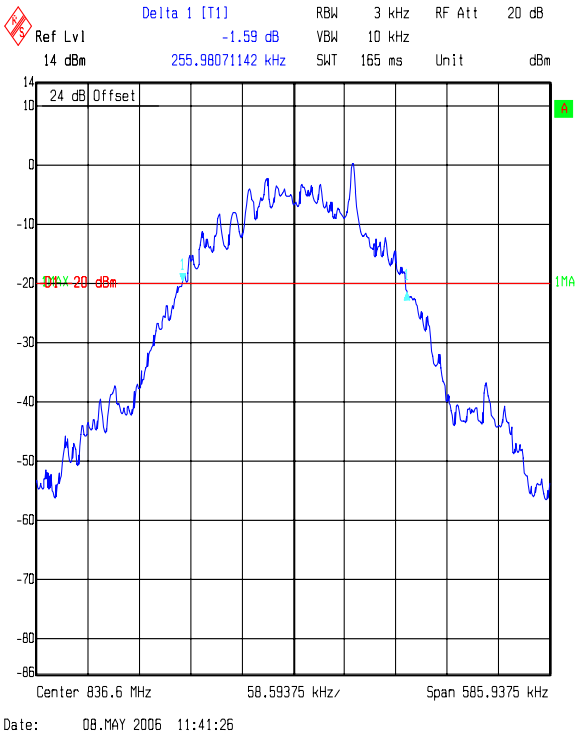
Results:

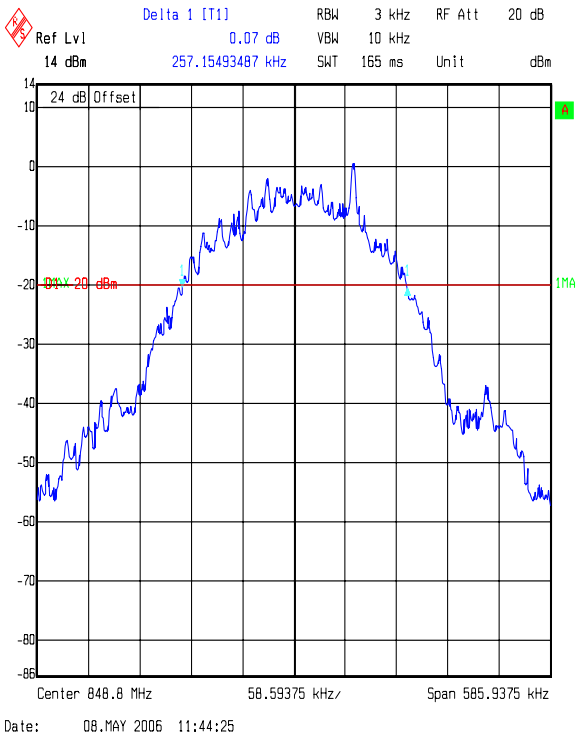
Channel	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (kHz)
Bottom	824.2	3.0	10.0	252.458041
Middle	836.6	3.0	10.0	255.980711
Top	848.8	3.0	10.0	257.154935

Test of: **Ericsson Enterprise AB**
Fixed Wireless Terminal - G32a
To: **FCC Part 22: 2005 (Subpart H) and FCC Part 24: 2005 (Subpart E)**

Transmitter Occupied Bandwidth: Section 2.1049 (Continued)







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.

7.2.8. 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.

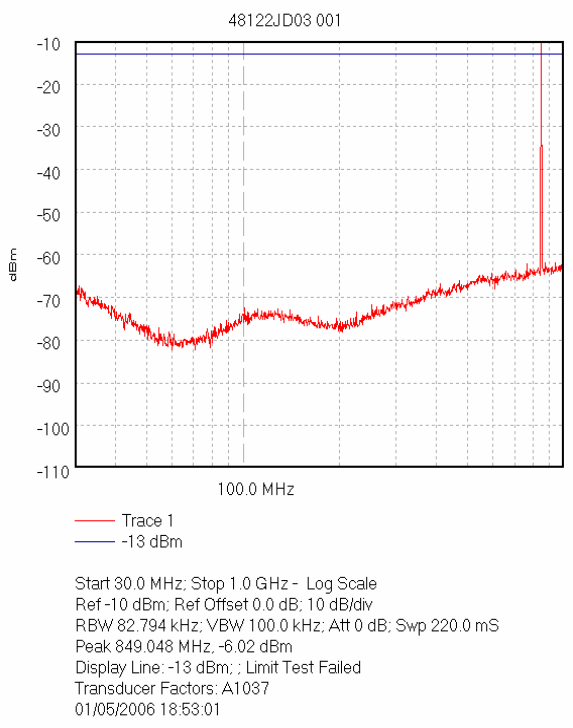
Results:

All emissions were 20 dB below the -13 dBm limits.

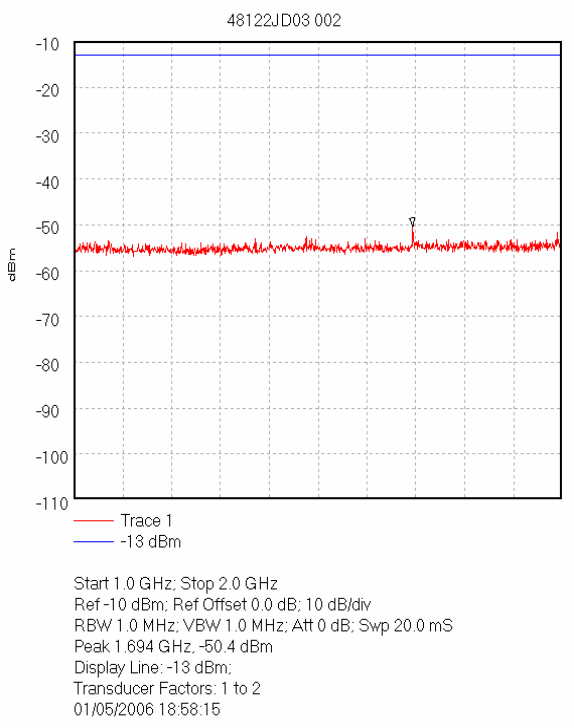
Note(s):

1. *No spurious emissions were detected within the -13 dBm limit, therefore no measurements were performed on the bottom, middle or top channels.*

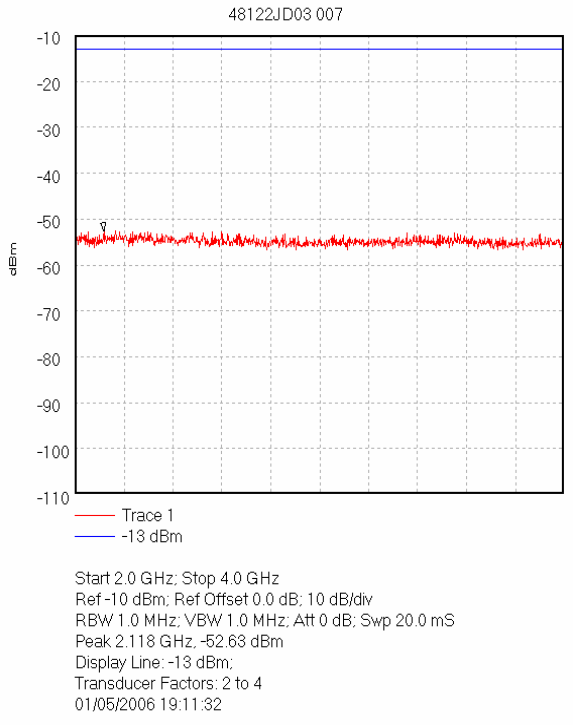
Transmitter Out of Band Radiated Emissions: Section 2.1053 & 22.917 (Continued)



Start 30.0 MHz; Stop 1.0 GHz - Log Scale
Ref -10 dBm; Ref Offset 0.0 dB; 10 dB/div
RBW 82.794 kHz; VBW 100.0 kHz; Att 0 dB; Swp 220.0 mS
Peak 849.048 MHz, -6.02 dBm
Display Line: -13 dBm; ; Limit Test Failed
Transducer Factors: A1037
01/05/2006 18:53:01

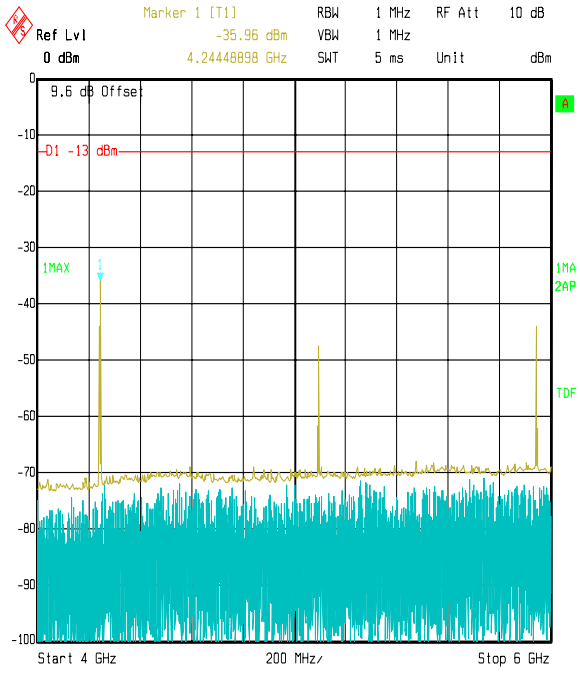


Start 1.0 GHz; Stop 2.0 GHz
Ref -10 dBm; Ref Offset 0.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.694 GHz, -50.4 dBm
Display Line: -13 dBm;
Transducer Factors: 1 to 2
01/05/2006 18:58:15

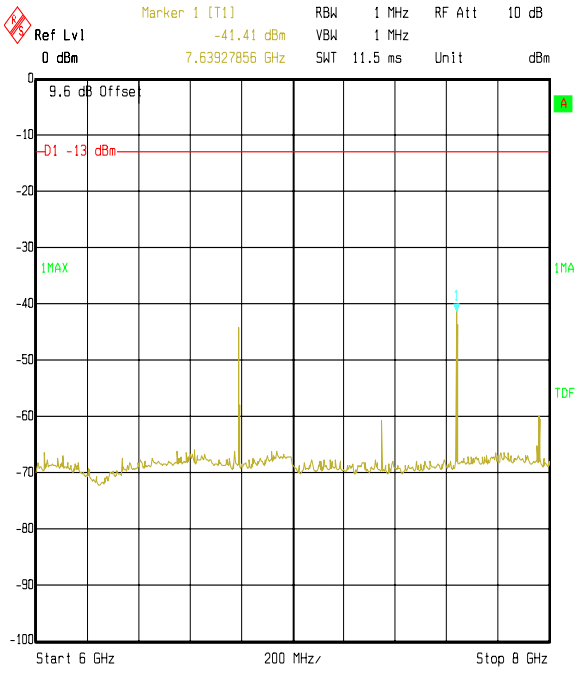


Start 2.0 GHz; Stop 4.0 GHz
Ref -10 dBm; Ref Offset 0.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.118 GHz, -52.63 dBm
Display Line: -13 dBm;
Transducer Factors: 2 to 4
01/05/2006 19:11:32

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



Title: Flextronic EUT: 6120. FCC P22 Radiated Emissions
Comment A: 48122JD03 Tx Mode, Top Channel, GSM 850
Date: 04.MAY 2006 17:43:56



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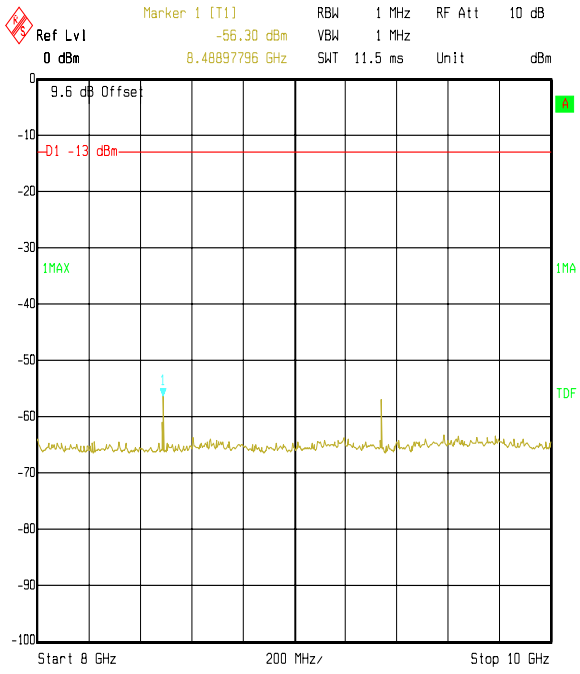
Comment A: 48122JD03 Tx Mode, Top Channel, GSM 850
Date: 04.MAY 2006 18:27:59



Title: Flextronic EUT: 6120. FCC P22 Radiated Emissions
Comment A: 48122JD03 Tx Mode, Top Channel, GSM 850
Date: 04.MAY 2006 18:43:34

7.2.9. 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.

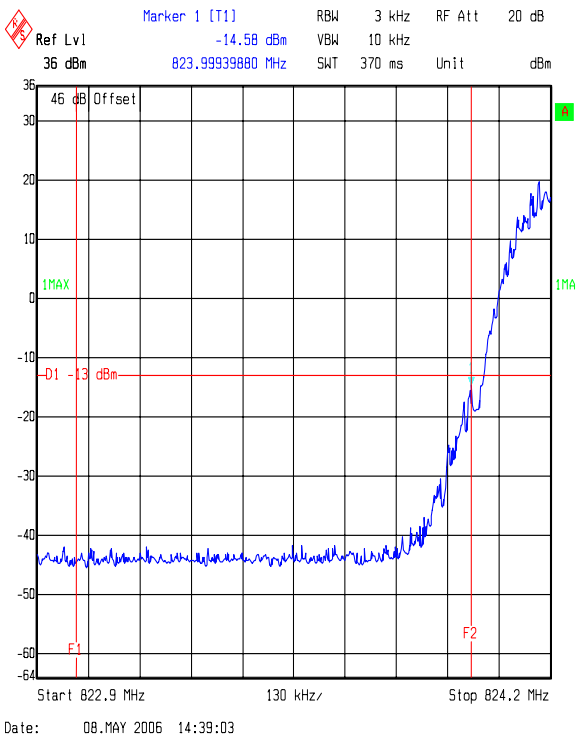
Results: (GSM Mode)

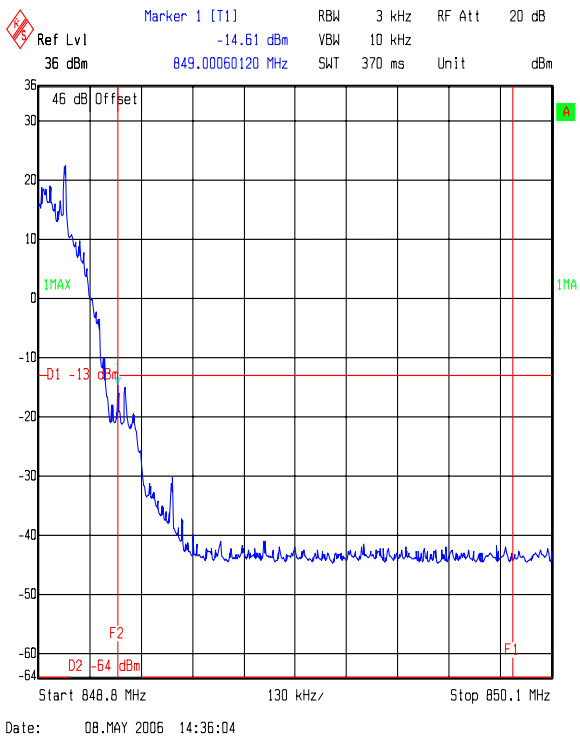
Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-14.6	-13.0	1.6	Complied

Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
849	-14.6	-13.0	1.6	Complied





7.2.10. 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.

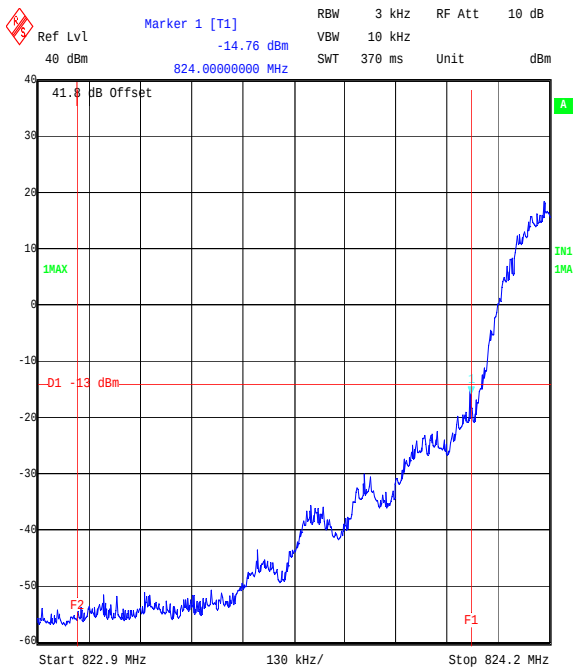
Results: (GPRS Mode)

Bottom Band Edge

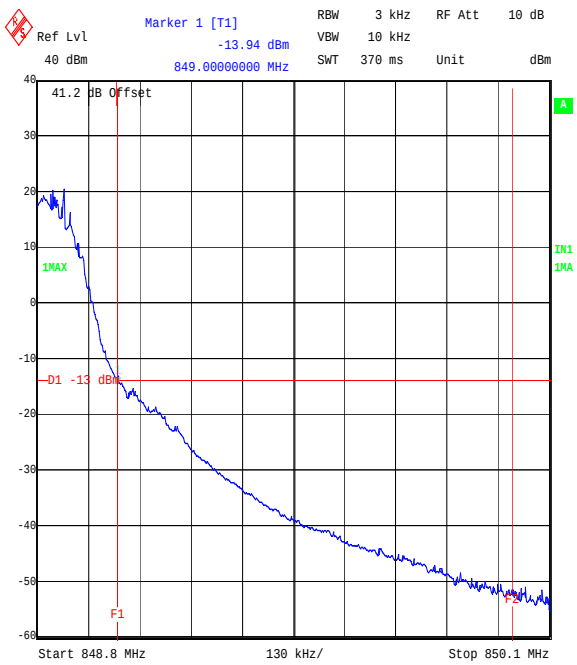
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-14.8	-13.0	1.8	Complied

Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
849	-13.9	-13.0	0.9	Complied



Title: Flextronic EUT: G32a FCC Part 22. Radiated Band Edge
Comment A: 48122JD03 Operating in GSM 850, Bottom Channel, GPRS Mode.
Date: 10.JUL.2006 12:31:39



Title: Flextronic EUT: G32a FCC Part 22. Radiated Band Edge
Comment A: 48122JD03 Operating in GSM 850, Top Channel, GPRS Mode.
Date: 10.JUL.2006 12:36:31

7.2.11. 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.

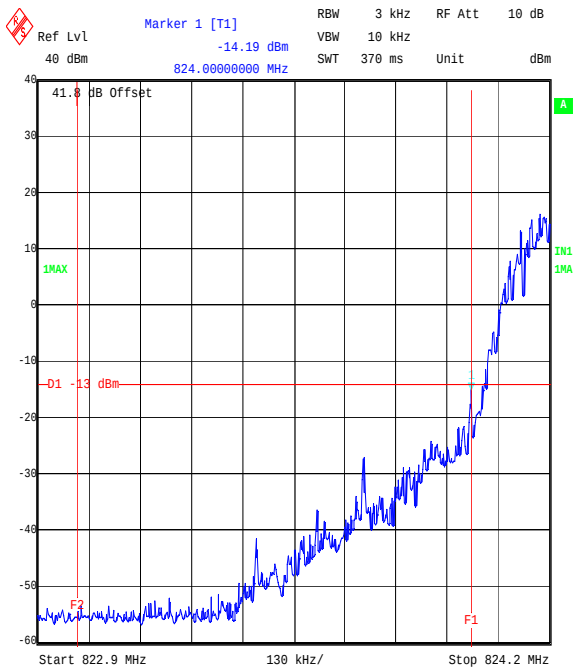
Results: (EDGE Mode)

Bottom Band Edge

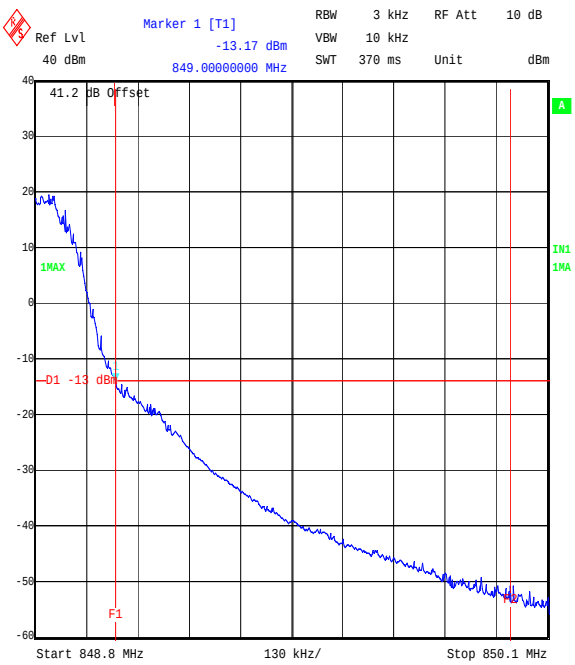
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-14.2	-13.0	1.2	Complied

Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
849	-13.2	-13.0	0.2	Complied



Title: Flextronic EUT: G32a FCC Part 22. Radiated Band Edge
Comment A: 48122JD03 Operating in GSM 850, Bottom Channel, EDGE Mode.
Date: 10.JUL.2006 12:25:54



Title: Flextronic EUT: G32a FCC Part 22. Radiated Band Edge
Comment A: 48122JD03 Operating in GSM 850, Top Channel, EDGE Mode.
Date: 10.JUL.2006 12:39:31

7.3. Test Results – FCC Part 24 (Subpart E)

7.3.1. Idle Mode AC Conducted Spurious Emissions: Section 15.107

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

Tests were performed to identify the maximum emissions levels present on the AC Mains line of the EUT.

Results:

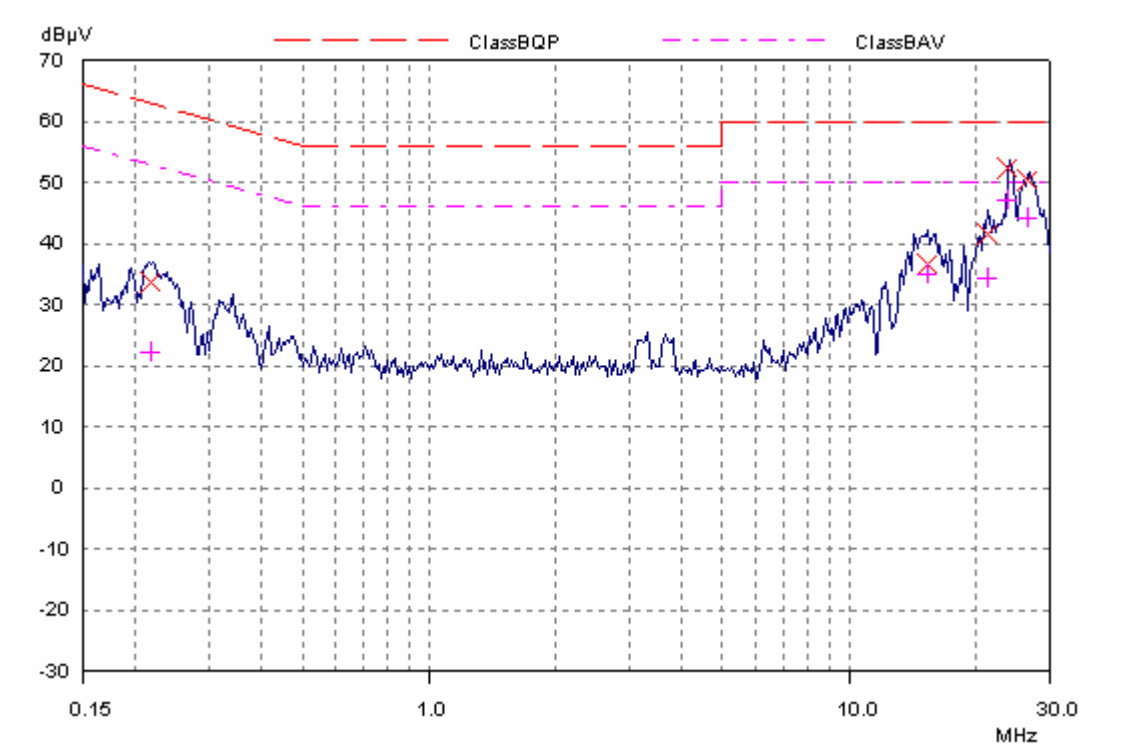
Quasi-Peak Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.21831	Neutral	33.60	62.88	29.28	Complied
15.36367	Neutral	36.62	60.00	23.38	Complied
21.30529	Live	41.47	60.00	18.53	Complied
23.92425	Live	52.47	60.00	7.53	Complied
26.69450	Live	50.28	60.00	9.72	Complied

Average Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.21831	Neutral	22.04	52.88	30.84	Complied
15.36367	Live	34.89	50.00	15.11	Complied
21.30529	Live	34.26	50.00	15.74	Complied
23.92425	Live	47.06	50.00	2.94	Complied
26.69450	Live	44.26	50.00	5.74	Complied

Idle Mode AC Conducted Spurious Emissions: Section 15.107 (Continued)



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

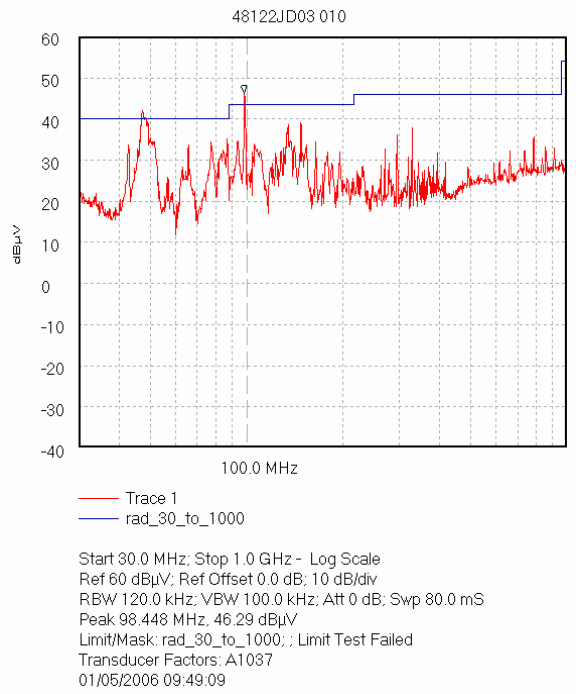
The EUT was configured as for receiver radiated emission - Part 24 testing as described in Section 9 of this report.

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
46.795	Vertical	23.1	40.0	16.9	Complied
86.899	Vertical	16.4	40.0	23.6	Complied
98.448	Vertical	34.2	43.5	9.3	Complied
133.966	Vertical	18.6	43.5	24.9	Complied
196.166	Vertical	14.1	43.5	29.4	Complied
262.677	Vertical	24.7	46.0	21.3	Complied
327.608	Horizontal	21.3	46.0	24.7	Complied
565.252	Horizontal	31.5	46.0	14.5	Complied
786.413	Vertical	29.7	46.0	16.3	Complied

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



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

Results:

Peak Level:

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
7.959629	Horizontal	41.7	-3.7	38.0	74.0	36.0	Complied

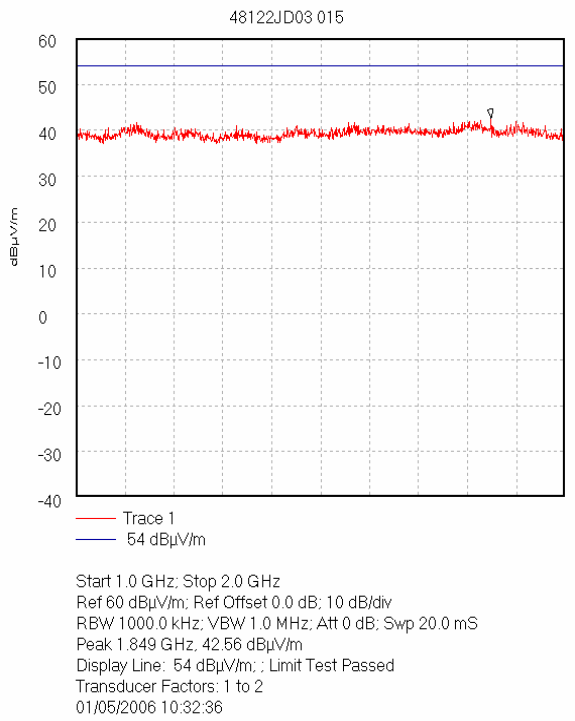
Average Level:

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
7.959629	Horizontal	39.7	-3.7	36.6	54.0	17.4	Complied

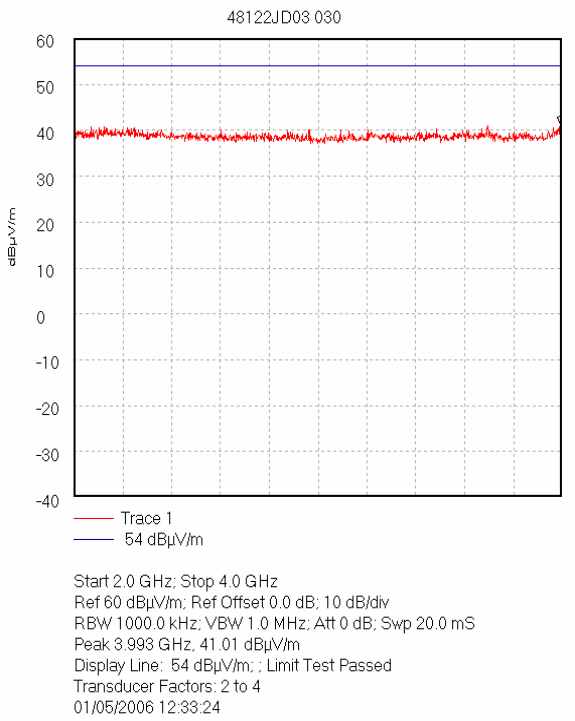
Note(s):

1. The transducer factor incorporates the antenna factor, cables losses, pre-amplifier gain and attenuations.

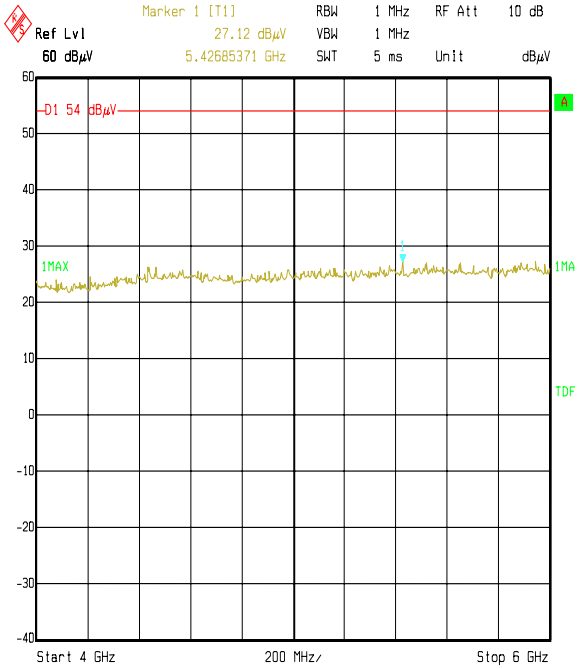
Idle Mode Radiated Spurious Emissions: Section 15.109 - Electric Field Strength Measurements (Frequency Range: 1 to 10 GHz) (Continued)



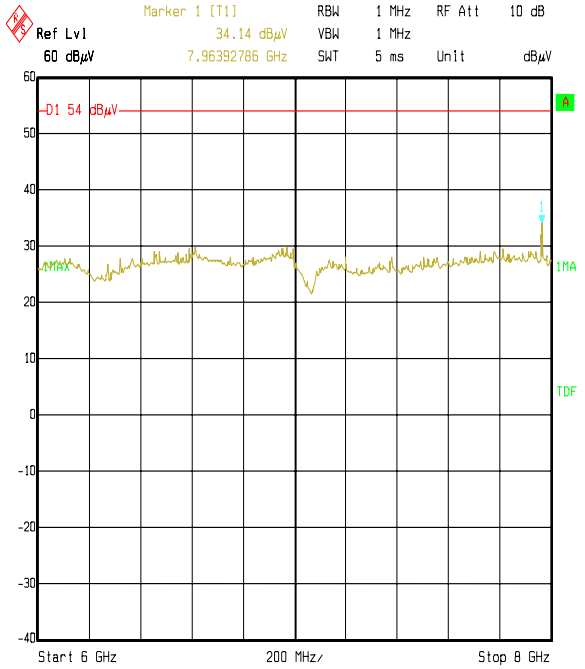
Start 1.0 GHz; Stop 2.0 GHz
Ref 60 dBµV/m; Ref Offset 0.0 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.849 GHz, 42.56 dBµV/m
Display Line: 54 dBµV/m; ; Limit Test Passed
Transducer Factors: 1 to 2
01/05/2006 10:32:36



Start 2.0 GHz; Stop 4.0 GHz
Ref 60 dBµV/m; Ref Offset 0.0 dB; 10 dB/div
RBW 1000.0 kHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 3.993 GHz, 41.01 dBµV/m
Display Line: 54 dBµV/m; ; Limit Test Passed
Transducer Factors: 2 to 4
01/05/2006 12:33:24

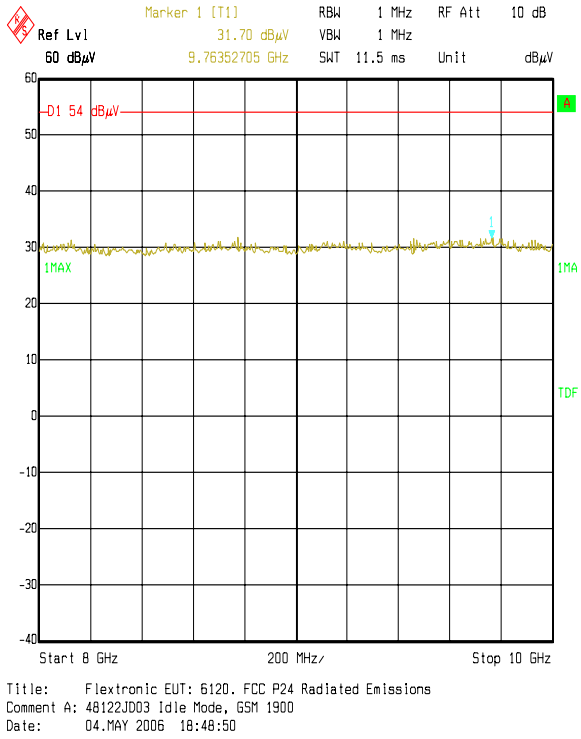


Title: Flextronic EUT: 6120. FCC P24 Radiated Emissions
Comment A: 48122JD03 Idle Mode, GSM 1900
Date: 04.MAY 2006 17:49:15



Title: Flextronic EUT: 6120. FCC P24 Radiated Emissions
Comment A: 48122JD03 Idle Mode, GSM 1900
Date: 04.MAY 2006 18:00:49

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



7.3.4. 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	28.7	33.0	4.3	Complied
Middle	1879.8	Vertical	29.6	33.0	3.4	Complied
Top	1909.8	Horizontal	29.3	33.0	3.7	Complied

7.3.5. Transmitter Frequency Stability (Temperature Variation): Section 24.235

The EUT was configured as for frequency Part 24 stability measurements as described in Section 9 of this report.

Tests were performed to identify the maximum frequency error of the EUT with variations in ambient temperature.

Results:

Bottom Channel (1850.2 MHz)

Temperature (ºC)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (Hz)	Result
-30	-23	1850.199977	1850	0.199977	Complied
-20	-53	1850.199947	1850	0.199947	Complied
-10	-30	1850.199970	1850	0.199970	Complied
0	-12	1850.199988	1850	0.199988	Complied
10	-26	1850.199974	1850	0.199974	Complied
20	-18	1850.199982	1850	0.199982	Complied
30	-7	1850.199993	1850	0.199993	Complied
40	-5	1850.199995	1850	0.199995	Complied
50	-4	1850.199996	1850	0.199996	Complied

Transmitter Frequency Stability (Temperature Variation): Section 24.235 (Continued)

Results:

Top Channel (1909.8 MHz)

Temperature (ºC)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (Hz)	Result
-30	38	1909.800038	1910	0.199962	Complied
-20	-16	1909.799984	1910	0.200016	Complied
-10	-19	1909.799981	1910	0.200019	Complied
0	1	1909.800001	1910	0.199999	Complied
10	13	1909.800013	1910	0.199987	Complied
20	15	1909.800015	1910	0.199985	Complied
30	12	1909.800012	1910	0.199988	Complied
40	-33	1909.799967	1910	0.200033	Complied
50	-6	1909.799994	1910	0.200006	Complied

7.3.6. Transmitter Frequency Stability (Voltage Variation): Section 24.235

The EUT was configured as for frequency Part 24 stability measurements as described in Section 9 of this report.

Tests were performed to identify the maximum frequency error of the EUT with variations in nominal operating voltage.

Results:

Bottom Channel (1850.2 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
93.5	-6	1850.199994	1850	0.199994	Complied
110	-8	1850.199992	1850	0.199992	Complied
126.5	-11	1850.199989	1850	0.199989	Complied

Top Channel (1909.8 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
93.5	-3	1909.799997	1910	2.000003	Complied
110	1	1909.800001	1910	0.199999	Complied
126.5	1	1909.800001	1910	0.199999	Complied

7.3.7. Transmitter Occupied Bandwidth: Section 24.238

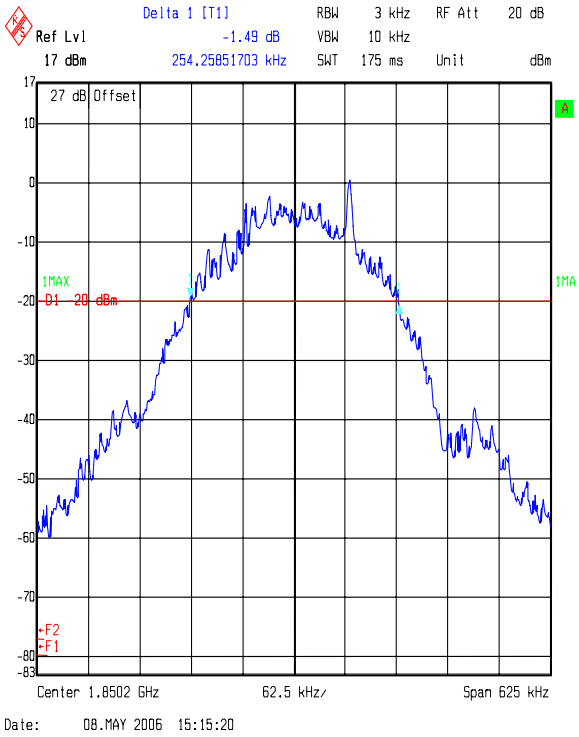
The EUT was configured as for occupied bandwidth measurements as described in Section 9 of this report.

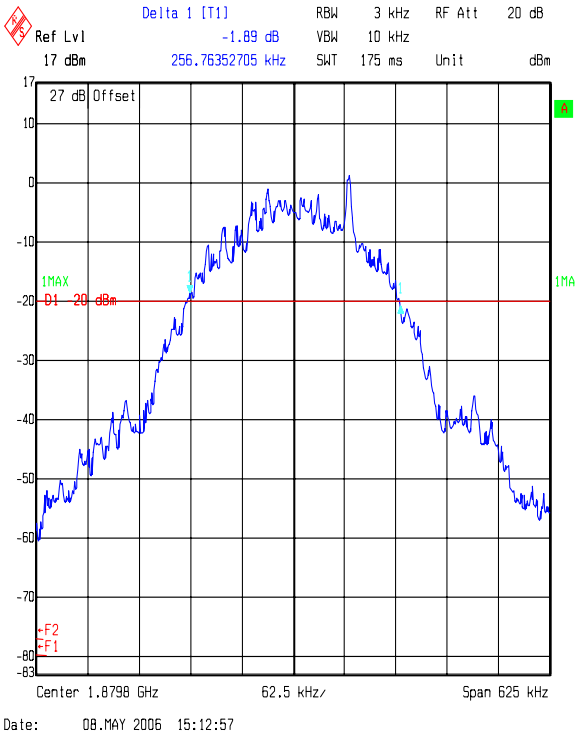
Tests were performed to identify the maximum bandwidth occupied by the fundamental frequency of the EUT.

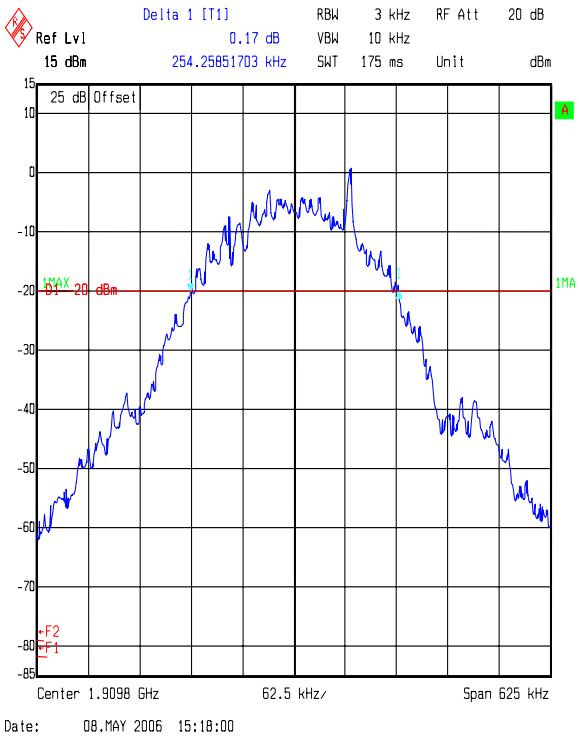
Results:

Channel	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	3.0	10.0	255.511
Middle	1879.8	3.0	10.0	256.764
Top	1909.8	3.0	10.0	254.259

Transmitter Occupied Bandwidth: Section 24.238 (Continued)







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.

7.3.8. 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
7400.760	-31.8	-13.0	18.8	Complied

Middle Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
7519.154	-30.1	-13.0	17.1	Complied

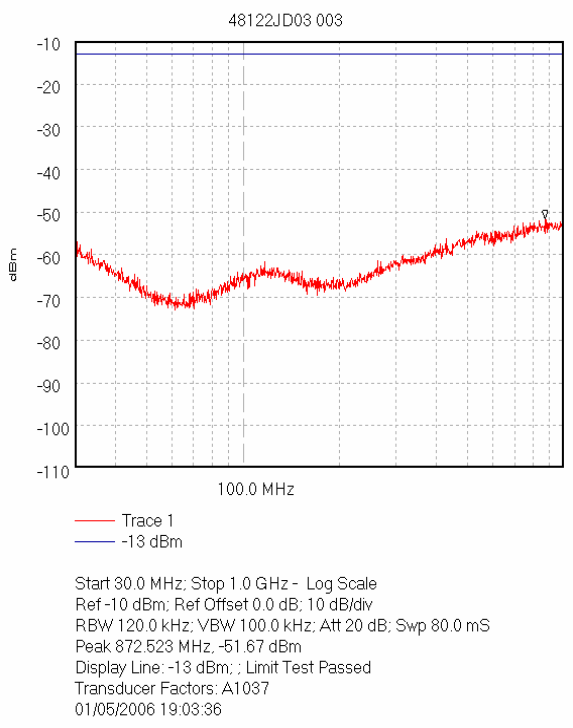
Top Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
7639.243	-29.7	-13.0	16.7	Complied

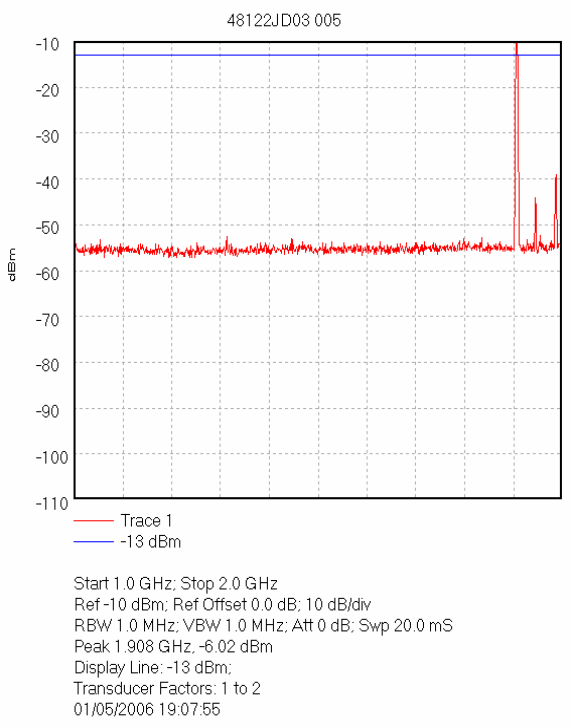
Note(s):

1. *The emissions at 1987.7 MHz and 1945.5 MHz emanate from the test set, not from the EUT, therefore no emissions level were recorded.*

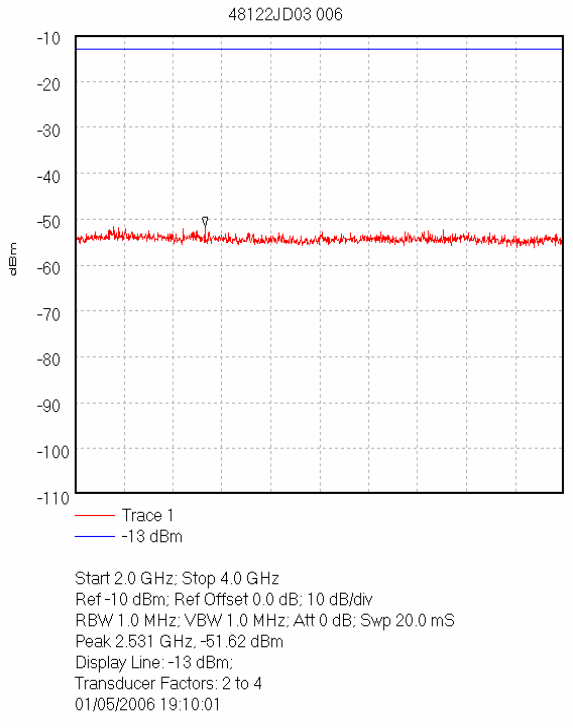
Transmitter Out of Band Radiated Emissions: Section 2.1053 & 24.238 (Continued)



Start 30.0 MHz; Stop 1.0 GHz - Log Scale
Ref -10 dBm; Ref Offset 0.0 dB; 10 dB/div
RBW 120.0 kHz; VBW 100.0 kHz; Att 20 dB; Swp 80.0 mS
Peak 872.523 MHz, -51.67 dBm
Display Line: -13 dBm; ; Limit Test Passed
Transducer Factors: A1037
01/05/2006 19:03:36

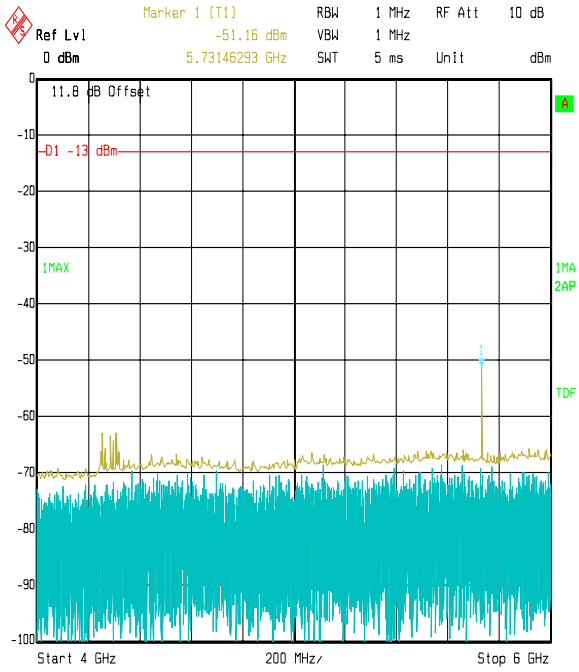


Start 1.0 GHz; Stop 2.0 GHz
Ref -10 dBm; Ref Offset 0.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 1.908 GHz, -6.02 dBm
Display Line: -13 dBm;
Transducer Factors: 1 to 2
01/05/2006 19:07:55

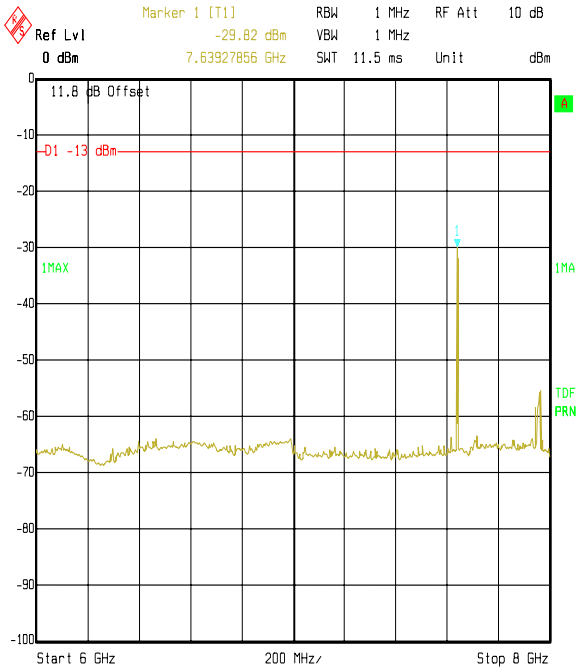


Start 2.0 GHz; Stop 4.0 GHz
Ref -10 dBm; Ref Offset 0.0 dB; 10 dB/div
RBW 1.0 MHz; VBW 1.0 MHz; Att 0 dB; Swp 20.0 mS
Peak 2.531 GHz, -51.62 dBm
Display Line: -13 dBm;
Transducer Factors: 2 to 4
01/05/2006 19:10:01

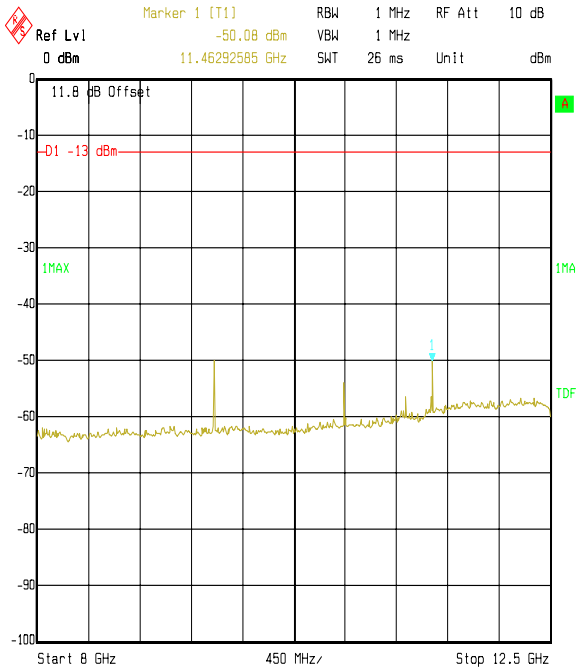
Transmitter Out of Band Radiated Emissions: Section 2.1053 & 24.238 (Continued)



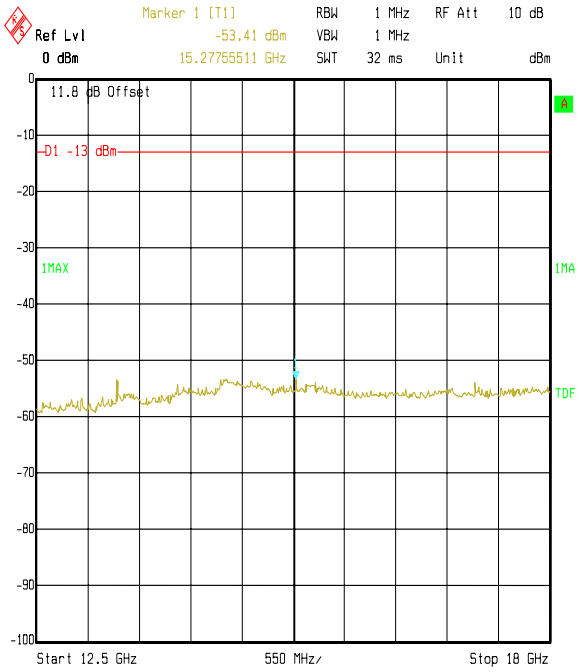
Title: Flextronic EUT: 6120. FCC P24 Radiated Emissions
Comment A: 48122JD03 Tx Mode, Top Channel, GSM 1900
Date: 04.MAY 2006 17:39:43



Title: Flextronic EUT: 6120. FCC P24 Radiated Emissions
Comment A: 48122JD03 Tx Mode, Top Channel, GSM 1900
Date: 04.MAY 2006 18:30:25

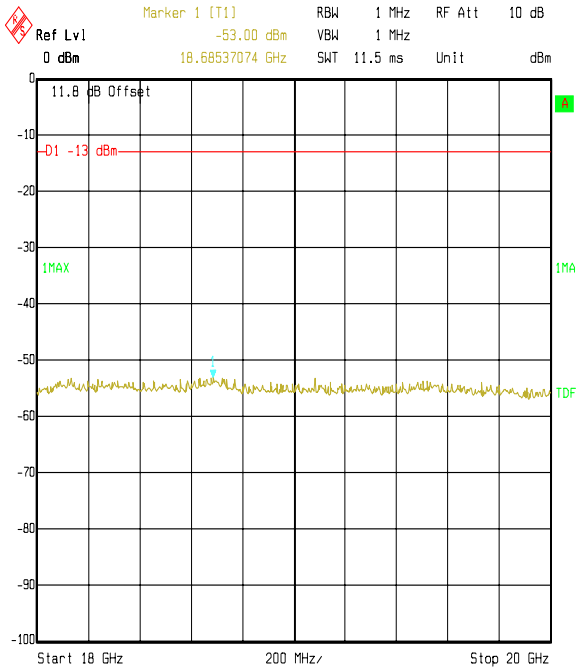


Title: Flextronic EUT: 6120. FCC P24 Radiated Emissions
Comment A: 48122JD03 Tx Mode, Top Channel, GSM 1900
Date: 04.MAY 2006 18:46:25



Title: Flextronic EUT: 6120. FCC P24 Radiated Emissions
Comment A: 48122JD03 Tx Mode, Top Channel, GSM 1900
Date: 04.MAY 2006 18:53:07

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



Title: Flextronic EUT: 6120. FCC P24 Radiated Emissions
Comment A: 48122JD03 Tx Mode, Top Channel, GSM 1900
Date: 04.MAY 2006 18:59:30

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	1948	6	1921
2	2227	7	1997
3	1953	8	2034
4	2081	9	1713
5	1891	10	2269
Total Peak Power:	20034 nW/MHz		

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

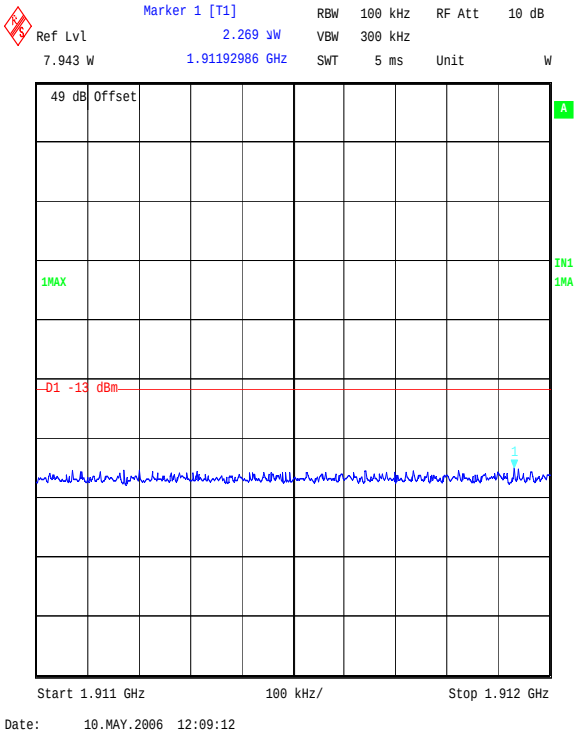
2nd 1 MHz block immediately outside adjacent frequency block

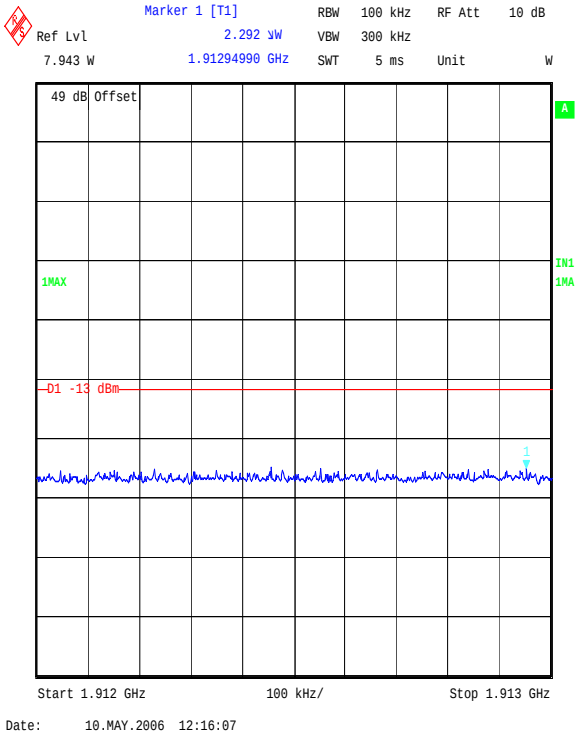
100 kHz Strip Number	Peak Power (nW/100 kHz)	100 kHz Strip Number	Peak Power (nW/100 kHz)
1	1532	6	1999
2	1820	7	2120
3	1698	8	1929
4	1753	9	2005
5	2188	10	2292
Total Peak Power:	19336 nW/MHz		

Results:

Band (MHz)	Peak Power (nW/MHz)	Peak Power (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Status
1911 to 1912	20034	-17.0	-13.0	4.0	Complied
1912 to 1913	19336	-17.1	-13.0	4.1	Complied

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





7.3.9. 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.

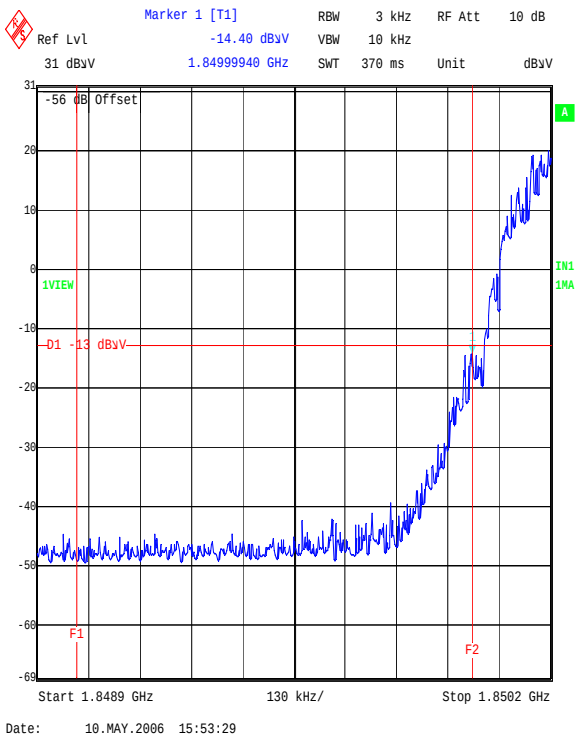
Results: (GSM Mode)

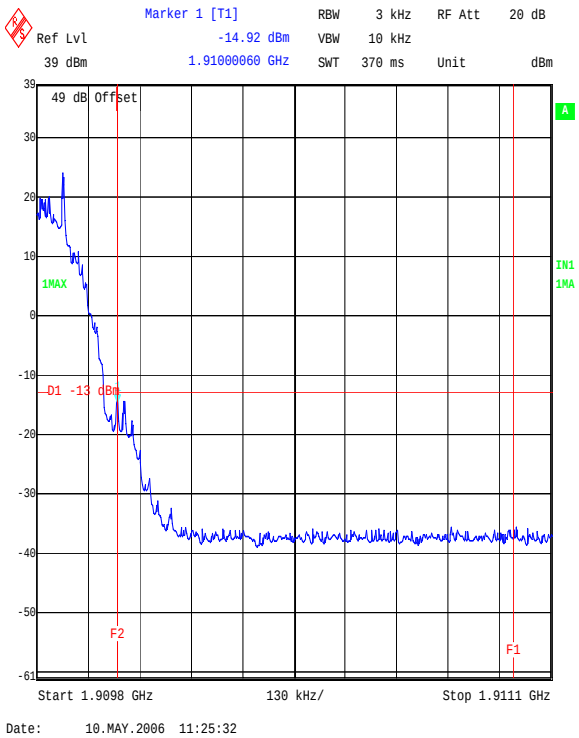
Bottom Band Edge

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-14.4	-13.0	1.4	Complied

Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-14.9	-13.0	1.9	Complied





7.3.10. 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.

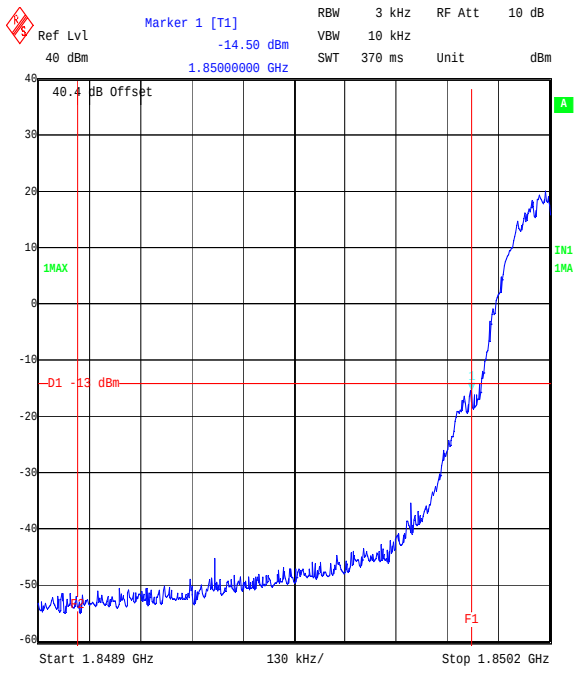
Results: (GPRS Mode)

Bottom Band Edge

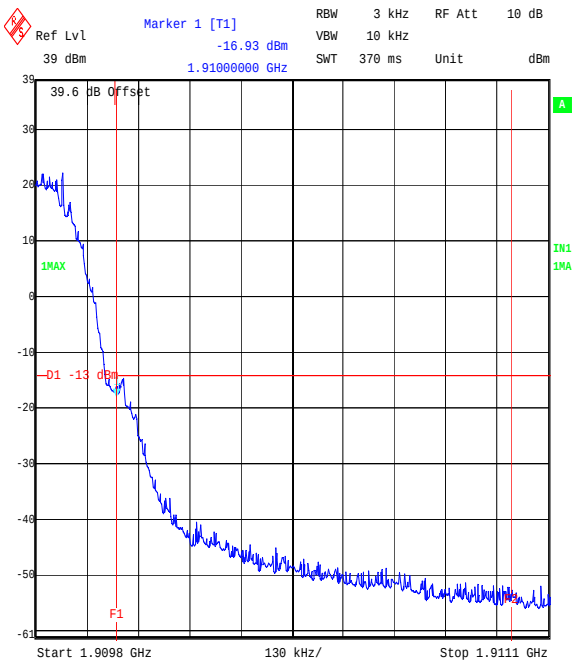
Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-14.5	-13.0	1.5	Complied

Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-16.9	-13.0	3.9	Complied



Title: Flextronic EUT: G32a FCC Part 24. Radiated Band Edge
Comment A: 48122JD03 Operating in PCS 1900, Bottom Channel, GPRS Mode.
Date: 10.JUL.2006 11:57:00



Title: Flextronic EUT: G32a FCC Part 24. Radiated Band Edge
Comment A: 48122JD03 Operating in PCS 1900, Top Channel, GPRS Mode.
Date: 10.JUL.2006 12:00:56

7.3.11. 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.

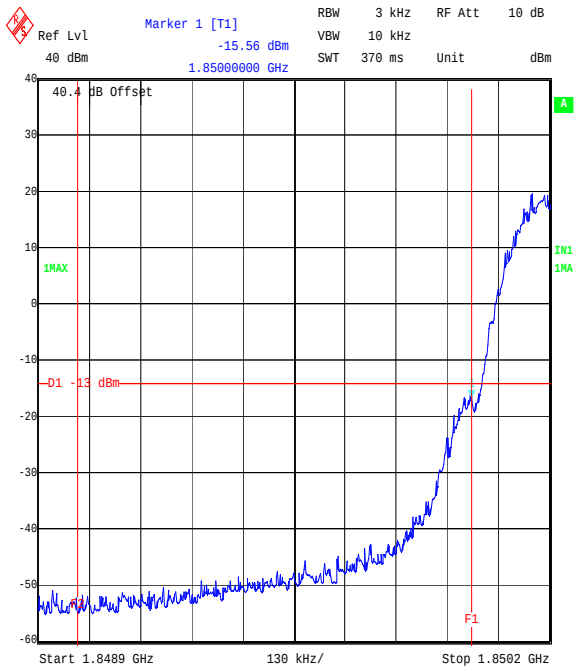
Results: (EDGE Mode)

Bottom Band Edge

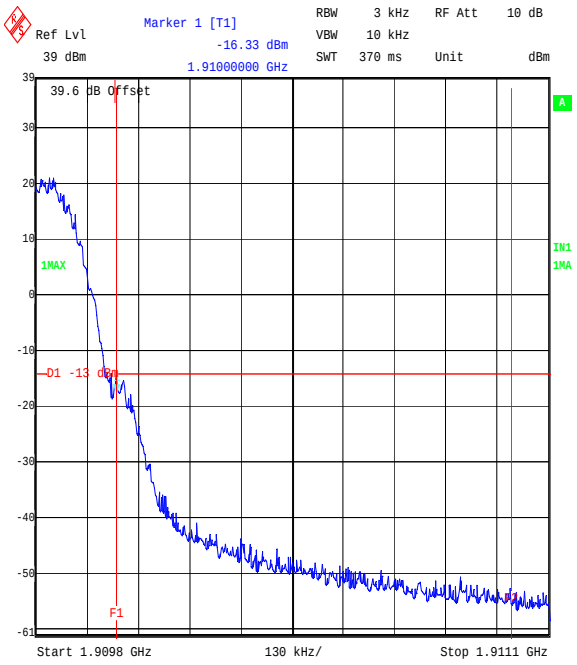
Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-15.6	-13.0	2.6	Complied

Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-16.3	-13.0	3.3	Complied



Title: Flextronic EUT: G32a FCC Part 24. Radiated Band Edge
Comment A: 48122JD03 Operating in PCS 1900, Bottom Channel, EDGE Mode.
Date: 10.JUL.2006 11:53:10



Title: Flextronic EUT: G32a FCC Part 24. Radiated Band Edge
Comment A: 48122JD03 Operating in PCS 1900, Top Channel, EDGE Mode.
Date: 10.JUL.2006 12:02:35

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
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.25 dB
Effective Radiated Power (ERP)	Not applicable	95%	±1.78 dB
Effective Isotropic Radiated Power (EIRP)	Not applicable	95%	±2.94 dB
Frequency Stability	Not applicable	95%	±11.37 ppm
Minimum Bandwidth	Not applicable	95%	±0.12%
Occupied Bandwidth	824 to 849 MHz	95%	± 0.12%
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±5.26 dB
Radiated Spurious Emissions	1 GHz to 26 GHz	95%	±2.94 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. AC Mains Conducted Emissions

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

The test was performed in a shielded enclosure with the equipment arranged as detailed in the standard on a wooden bench using the floor of the screened enclosure as the ground reference plane. The EUT was powered with 110V 60 Hz AC Mains supplied via a line impedance stabilisation network (LISN).

Initial measurements in the form of swept scans covering the entire measurement band were performed in order to identify frequencies on which the EUT was generating interference. In order to minimise the time taken for these swept measurements, a peak detector was used in conjunction with the appropriate detector IF measuring bandwidths (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and the duty cycle of the EUT. The test configuration was the same for the initial scans as for the final measurements.

Following the initial scans, a graph was produced giving an overview of the emissions from the EUT plotted against the appropriate specification limit. A tolerance line was set 6 dB below the specification limit and levels above the tolerance line were re-tested (at individual frequencies) using the appropriate detector function.

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

Receiver Function	Initial Scan	Final Measurements
Detector Type:	Peak	Quasi-Peak (CISPR)/Average
Mode:	Max Hold	Not applicable
Bandwidth:	10 kHz	9 kHz
Amplitude Range:	60 dB	20 dB
Measurement Time:	Not applicable	> 1 s
Observation Time:	Not applicable	> 15 s
Step Size:	Continuous sweep	Not applicable
Sweep Time:	Coupled	Not applicable

9.2. 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

9.3. 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

9.4. 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

9.5. Frequency Stability - FCC Part 2.1055

The EUT was situated within an environmental test chamber and connected directly to the GSM test set via an access port.

Measurements were performed with the EUT operating under extremes of temperature in 10 degree increments within the range -30 to 50 ºC.

Measurements were also performed at voltage extremes between the declared nominal supply voltage and at the declared endpoint voltage (for hand carried battery operated equipment) or by varying the primary supply voltage from 85% to 115% of the nominal value for all other equipment types.

The requirement was to determine the frequency stability of the device under specified environmental operating conditions.

Measurements were made on the top and bottom channels.

The EUT was switched off for a minimum of 30 minutes between each stage of testing while the environmental chamber stabilised at the next temperature within the stated temperature range.

The frequency error measured was converted to an error in ppm using the following formula as defined by TIA_EIA_603A:-

$$\text{ppm error} = \left(\frac{MCF_{MHz}}{ACF_{MHz}} - 1\right) * 10^6$$

where MCF_{MHz} is the measured carrier frequency in MHz
ACF_{MHz} is the assigned carrier frequency in MHz

The measured ppm had to be less then the relevant limits in order to comply.

9.6. Frequency Stability – FCC Part 24

The EUT was situated within an environmental test chamber and connected directly to the GSM test set via an access port.

Measurements were performed with the EUT operating under extremes of temperature in 10 degree increments within the range -30 to 50 ºC.

Measurements were also performed at voltage extremes between the declared nominal supply voltage and at the declared endpoint voltage (for hand carried battery operated equipment) or by varying the primary supply voltage from 85% to 115% of the nominal value for all other equipment types.

The requirement was to determine the frequency stability of the device under specified environmental operating conditions and ensure they remained within specified operating parameters.

Measurements were made on the top and bottom channels.

The EUT was switched off for a minimum of 30 minutes between each stage of testing while the environmental chamber stabilised at the next temperature within the stated temperature range.

Once the environmental chamber had reached thermal equilibrium, the nominal frequency of the EUT was measured and recorded. The recorded frequency was compared to the applicants declared operating frequency band edges.

In order to show compliance, the measured frequency must remain within the declared frequency band.

The reported data shows the nominal frequency drift and its margin from the band edge. If this margin is positive, the result is compliant. If it goes negative, the result is non-compliant. There is also a frequency graph presented offering the frequency variation around nominal frequency.

9.7. 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.

9.8. 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.

9.9. 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)
A027	Horn Antenna	Eaton	9188-2	301	08/06/06	36
A031	Horn Antenna	Eaton	91889-2	557	08/06/06	36
A067	LISN	Rohde & Schwarz	ESH3-Z5	890603/002	27/03/06	12
A1037	Bilog Antenna	Chase EMC	CBL6112B	2413	26/01/06	12
A1360	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	20112003	29/04/06	12
A1415	Directional Coupler	Atlantic	422057-1	306	Cal before use	N/A
A1492	Attenuator	M/A	FSC96341	2082-6173-10	Cal before use	N/A
A1494	Attenuator	MCL	BW -230W2	9935	Cal before use	N/A
A1534	Preamplifier	Hewlett Packard	8449B H02	3008A00405	Cal before use	N/A
A253	Horn Antenna	Flann Microwave	12240-20	128	02/07/04	36
A255	Horn Antenna	Flann Microwave	16240-20	519	06/10/03	36
A256	Horn Antenna	Flann Microwave	18240-20	400	06/10/03	36
A259	Bilog Antenna	Chase	CBL6111	1513	03/03/06	12
A392	Attenuator	Suhner	6803.17.B	None	Cal before use	N/A
A427	Horn Antenna	Flann Microwave	14240-20	150	06/10/03	36
A430	Horn Antenna	Flann Microwave	18240-20	425	06/10/03	36

Test Equipment Used (Continued)

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
E013	Environmental Chamber	Sanyo	ATMOS chamber	None	Cal before use	N/A
M003	Spectrum Monitor	Rohde & Schwarz	EZM	883 580/008	Cal not reqd.	N/A
M023	Test Receiver	Rohde & Schwarz	ESVP	872 991/027	10/04/06	12
M090	Spectrum Analyser	Rohde & Schwarz	ESBI	838494/005 836833/001	08/11/05	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	08/09/05	12
M1140	Radiocomms Analyser	Anritsu	MT8820A	6K0000647	16/03/06	12
M1229	Digital Multimeter	Fluke	179	87640015	06/03/06	12
M1242	Spectrum Analyser	Rohde & Schwarz	FSEM30	845986_022	22/09/06	12
M505/ M506	Spectrum Analyser	Rohde & Schwarz	ESBI	825316/010; 827060/004	17/03/06	12
S003	Power Control	Zen	E08	736699	Cal before use	N/A
S201	Site 1	RFI	1	None	18/07/06	12
S202	Site 2	RFI	2	None	25/09/06	12

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

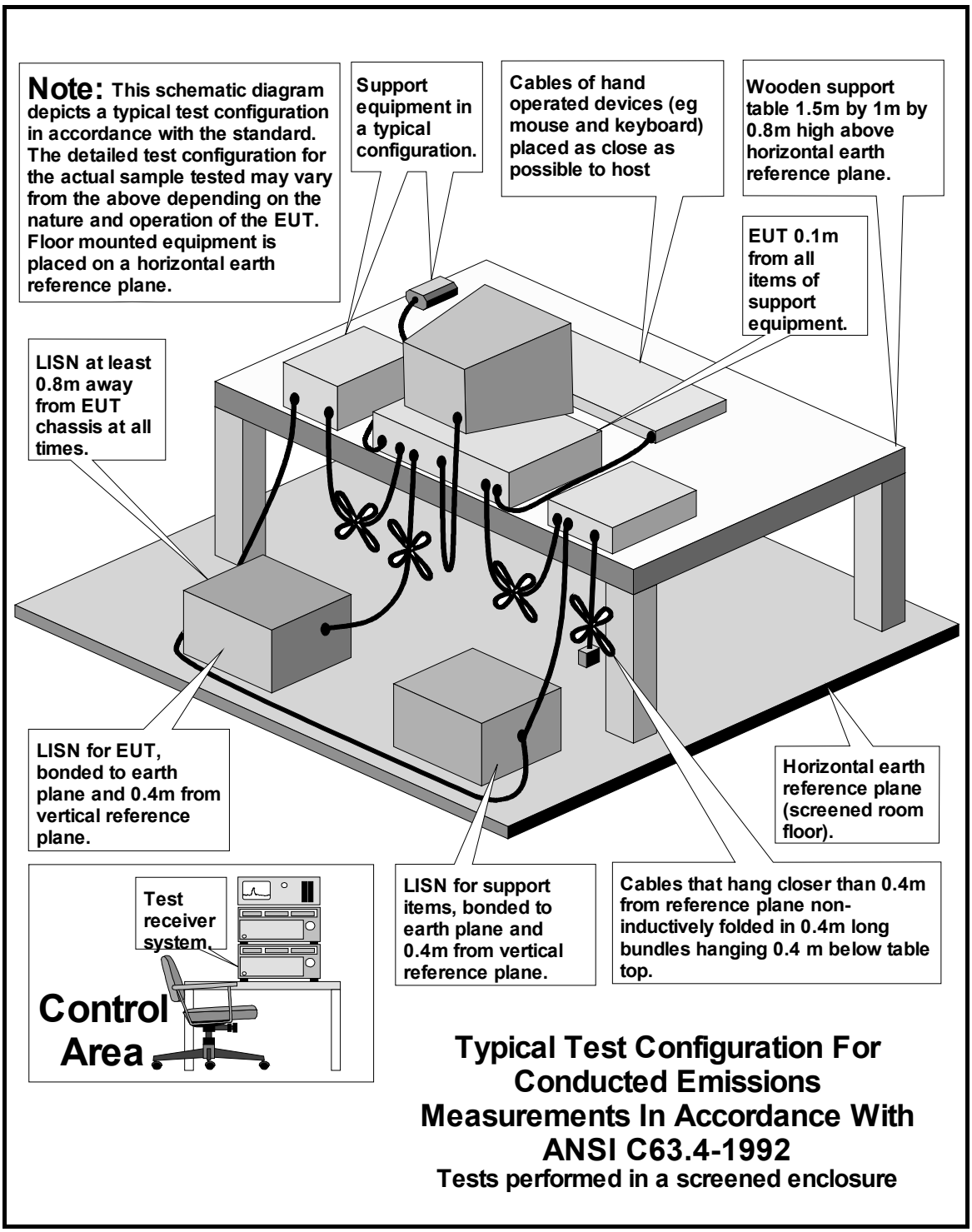
Appendix 2. Test Configuration Drawings

This appendix contains the following drawings:

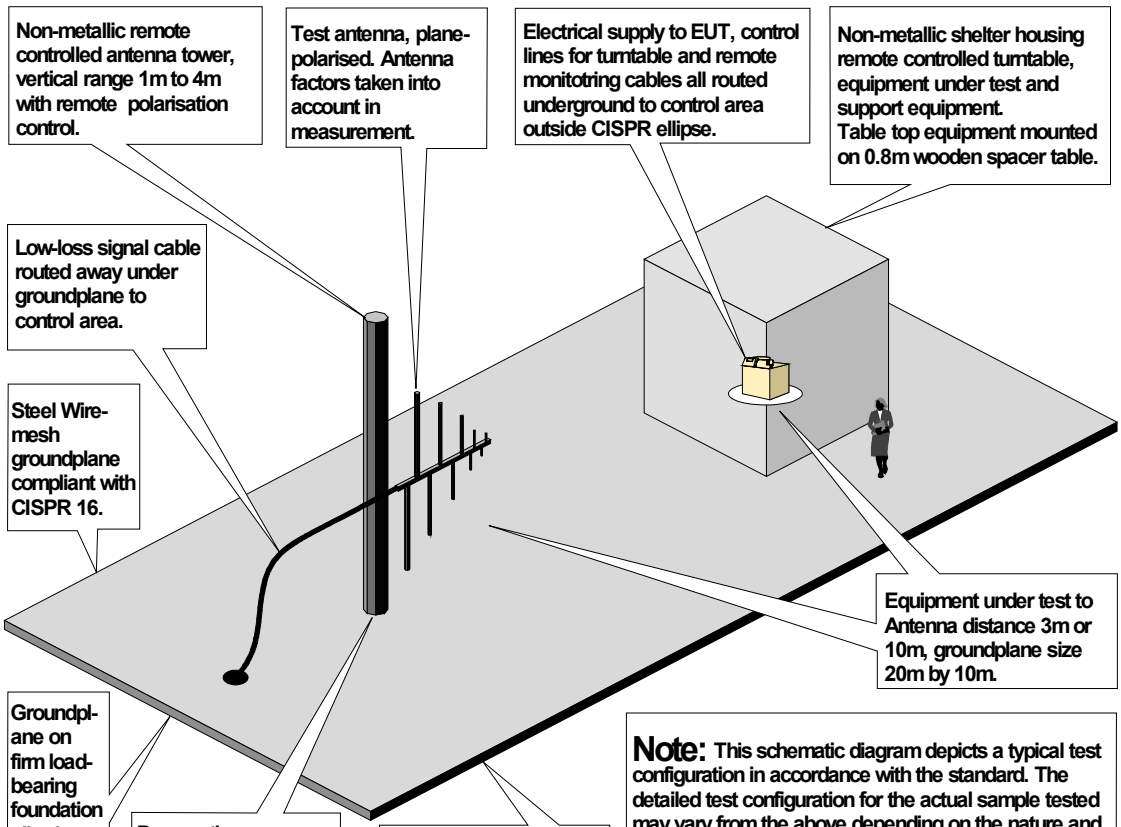
Drawing Reference Number	Title
DRG\48122JD03\EMICON	Test configuration for measurement of conducted emissions.
DRG\48122JD03\EMIRAD	Test configuration for measurement of radiated emissions.

Test of: Ericsson Enterprise AB
Fixed Wireless Terminal - G32a
To: FCC Part 22: 2005 (Subpart H) and FCC Part 24: 2005 (Subpart E)

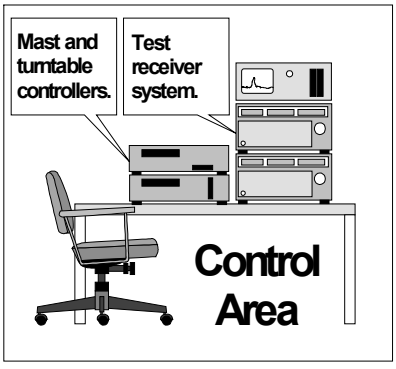
DRG\48122JD03\EMICON



DRG\48122JD03\EMIRAD



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



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