TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Nokia BH-102

To: FCC Part 15.247: 2006 (Subpart C), RSS-210 Issue 7 June 2007
& RSS-Gen Issue 2 June 2007

Test Report Serial No:
RFI/RPTE2/RP49596JD07A

Supersedes Test Report Serial No:
RFI/RPTE1/RP49596JD07A

This Test Report Is Issued Under The Authority Of Brian Watson, Operations Director: 	
Checked By: **Tony Henriques** 	**Report Copy No: PDF01**
Issue Date: 04 January 2008	**Test Dates: 20 November 2007 to 12 December 2007**

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Registered in England and Wales. Company number:2117901

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1. Client Information

Company Name:	Nokia Corporation
Address:	Joensuunkatu 7E FIN-24101 Finland
Contact Name:	Jarkko Luoma

2. Equipment Under Test (EUT)

The following information (with the exception of the date of receipt) has been supplied by the customer:

2.1. Description of EUT

The equipment under test is a Bluetooth Headset.

2.2. Identification of Equipment Under Test (EUT)

Description:	BH-102
Brand Name:	Nokia
Model Name or Number:	HS-107W
Serial Number:	Not Applicable
IMEI Number:	Not Applicable
FCC ID Number:	PYAHS-107W
Country of Manufacture:	China
Date of Receipt:	20 November 2007

2.3. Modifications Incorporated in the EUT

Mounting of antenna connector for conducted testing.
Mounting of serial connector for test control.

2.4. Accessories

The following accessories were supplied with the EUT during testing:

Description:	AC/DC Charger
Brand Name:	Nokia
Model Name or Number:	AC-3
Serial Number:	None Stated
Cable Length and Type:	None Stated
Country of Manufacture:	None Stated
Connected to Port	Charger Port

Description:	AC/DC Charger
Brand Name:	Nokia
Model Name or Number:	AC-4
Serial Number:	None Stated
Cable Length and Type:	None Stated
Country of Manufacture:	None Stated
Connected to Port	Charger Port

Description:	AC/DC Charger
Brand Name:	Nokia
Model Name or Number:	DC-4
Serial Number:	None Stated
Cable Length and Type:	None Stated
Country of Manufacture:	None Stated
Connected to Port	Charger Port

2.5. Additional Information Related to Testing

Intended Operating Environment:	Residential, Commercial and Within GSM Coverage		
Equipment Category:	Bluetooth		
Type of Unit:	Portable (Standalone battery powered device), Transceiver		
Power Supply Requirement:	Internal battery Supply of: 3.7V		
Maximum Power Output (EIRP)	7.4 dBm		
Transmit Frequency Range:	2402 to 2480 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	0	2402
	Middle	39	2441
	Top	78	2480
Receive Frequency Range:	2402 to 2480 MHz		
Receive Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	0	2402
	Middle	39	2441
	Top	78	2480

2.6. Port Identification

Port	Description	Type / Length	Applicability
1	DC-Jack	2mm	For charging
2	Serial interface	SPI/UART	For testing

3. Test Specification, Methods and Procedures

3.1. Test Specification

Reference:	FCC Part 15.247: 2006 Subpart C
Title:	Code of Federal Regulations, Part 15.247 (47CFR15) (Intentional Radiators operating within the band 2400 MHz to 2483.5 MHz)

Reference:	RSS-210 Issue 7 June 2007
Title:	Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

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

3.2. Methods and Procedures

The methods and procedures used were as detailed in:

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.

DA00-705 (2000)
Title: Filing and Frequency Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

3.3. 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 specification.

5. Operation and Configuration of the EUT during Testing

5.1. Operating Modes

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

- Transmit and Idle modes.
- Normal Rate, Maximum Power.

5.2. Configuration and Peripherals

The EUT was tested in the following configuration:

Connected to a Bluetooth tester and configured to Bottom, Middle and Top channels for all transmitter test and detached for Idle mode tests.

6. Summary of Test Results

Range of Measurements	FCC Part 15 Reference	IC RSS Reference	Port Type	Results
Idle Mode AC Conducted Emissions	15.107	RSS-Gen 6.0	AC Mains	Complied
Idle Mode Radiated Spurious Emissions	15.109	RSS-Gen 7.2.2	Antenna	Complied
Transmitter 20 dB Bandwidth	15.247(a)(1)	RSS-210 A8.1(a)	Antenna	Complied
Transmitter Carrier Frequency Separation	15.247(a)(1)	RSS-210 A8.1(b)	Antenna	Complied
Transmitter Average Time of Occupancy	15.247(a)(1)(iii)	RSS-210 A8.1(d)	Antenna	Complied
Transmitter Maximum Peak Output Power	15.247(b)(1)	RSS-210 A8.4(2)	Antenna	Complied
Transmitter Radiated Emissions	15.247(d) & 15.209(a)	RSS-210 A8.5	Antenna	Complied
Transmitter Band Edge Radiated Emissions	15.247(d) & 15.209(a)	RSS-210 A8.5	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

FCC Site Registration Number: 90895

IC Site Registration Number: 3485

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

7.2.1. Idle Mode AC Conducted Spurious Emissions: Section 15.107

The EUT was configured 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:

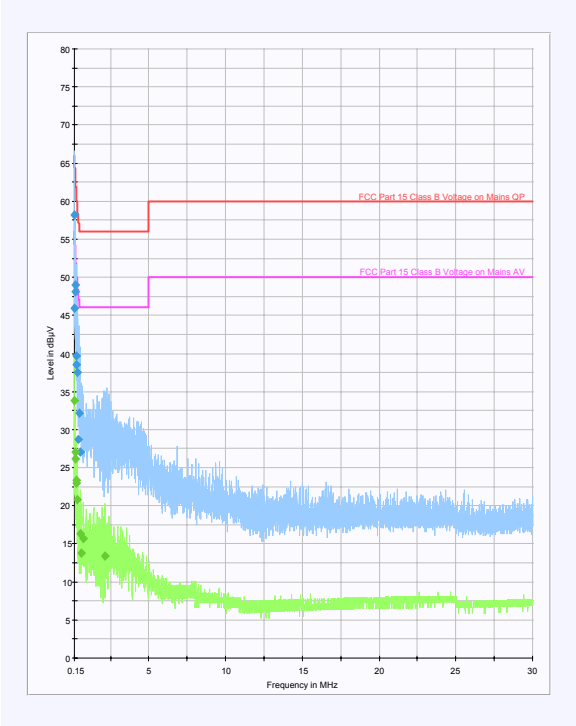
Quasi-Peak Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.150000	Live	58.1	66.0	7.9	Complied
0.174000	Neutral	46.0	64.8	18.8	Complied
0.222000	Live	48.9	62.7	13.8	Complied
0.226000	Live	48.1	62.6	14.5	Complied
0.290000	Neutral	39.7	60.5	20.8	Complied
0.294000	Neutral	38.5	60.4	21.9	Complied
0.370000	Live	37.6	58.5	20.9	Complied
0.430000	Live	28.8	57.3	28.5	Complied
0.442000	Live	32.2	57.0	24.8	Complied
0.514000	Neutral	27.0	56.0	29.0	Complied

Average Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.154000	Live	33.8	55.8	22.0	Complied
0.222000	Live	27.0	52.7	25.7	Complied
0.226000	Live	26.1	52.6	26.5	Complied
0.290000	Live	23.4	50.5	27.1	Complied
0.294000	Live	23.0	50.4	27.4	Complied
0.370000	Live	20.8	48.5	27.7	Complied
0.522000	Live	16.3	46.0	29.7	Complied
0.586000	Live	13.8	46.0	32.2	Complied
0.726000	Live	15.7	46.0	30.3	Complied
2.162000	Live	13.4	46.0	32.6	Complied

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. Idle Mode Radiated Spurious Emissions

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

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

Results:

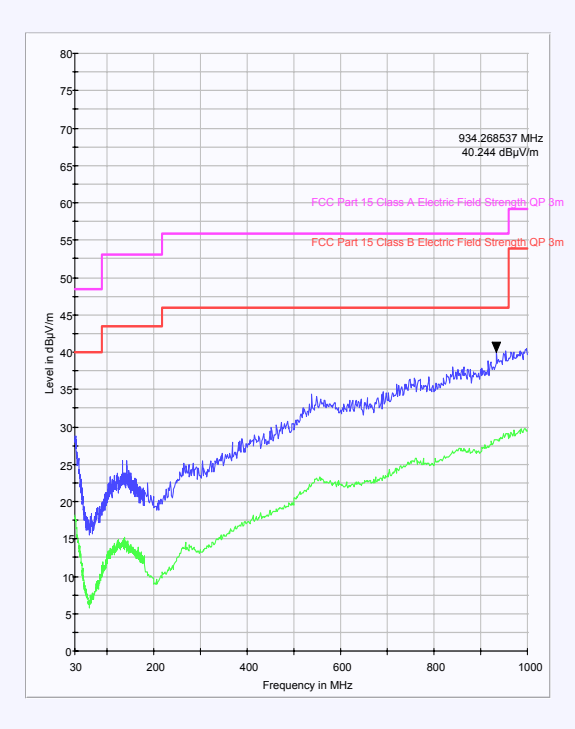
Electric Field Strength Measurements (Frequency Range: 30 MHz to 1000 MHz)

Frequency (MHz)	Antenna Polarity	Peak Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
934.268	Vertical	40.2	46.0	5.8	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 quasi-peak limit as this is the worst case.*

Idle Mode Radiated Spurious Emissions (Continued)



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

7.2.3. Idle Mode Radiated Spurious Emissions

Results:

Electric Field Strength Measurements (Frequency Range: 1 GHz to 12.5 GHz)

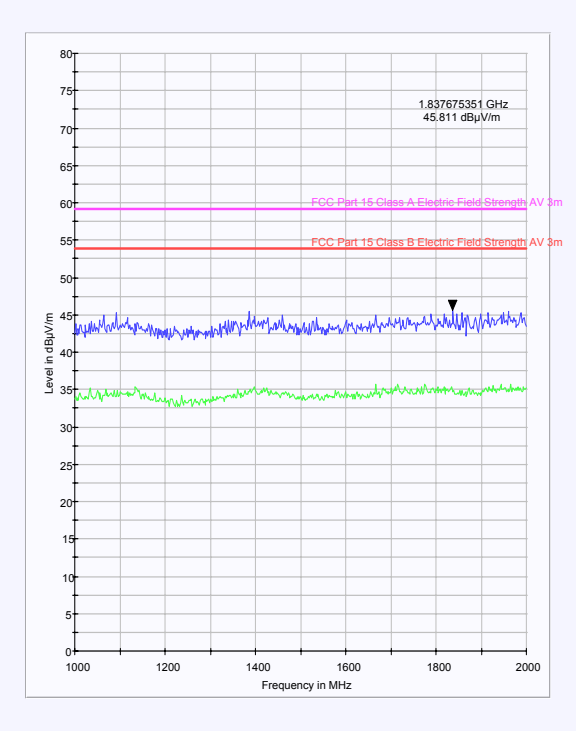
Highest Peak Level:

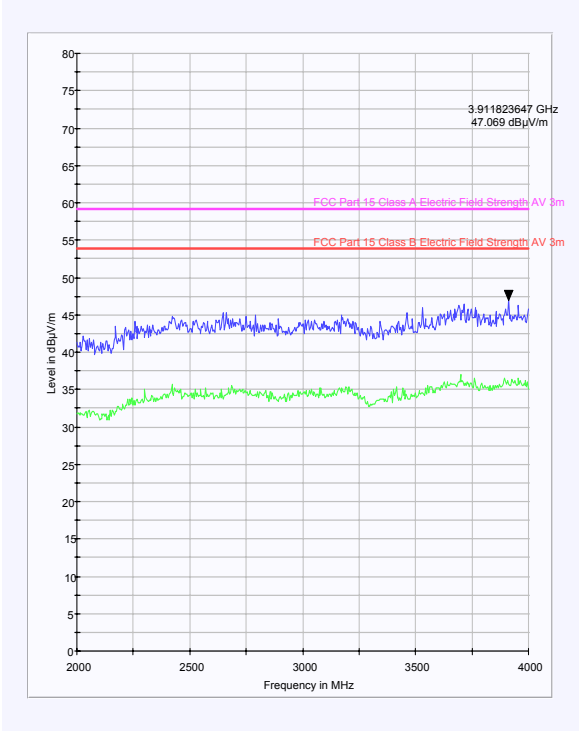
Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
3.912	Vertical	44.8	2.3	47.1	54.0	8.9	Complied

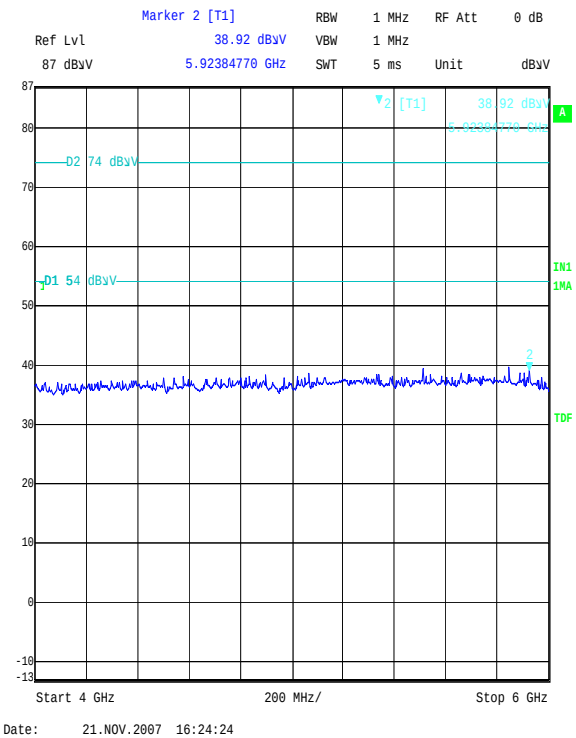
Note(s):

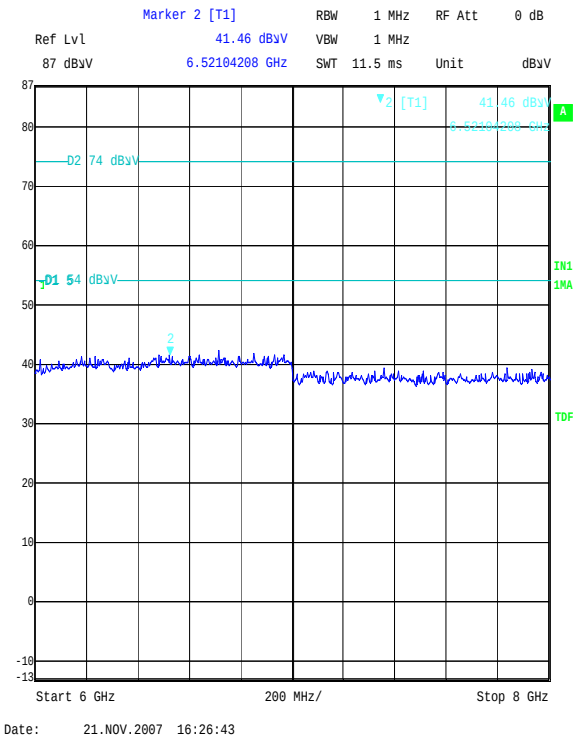
1. *No spurious emissions were detected above the noise floor of the measuring receiver; therefore, the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.*
2. *The emission at 10.687 GHz shown on the plot is an ambient that is not produced by the EUT and, therefore was not measured.*

Idle Mode Radiated Spurious Emissions (Continued)









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

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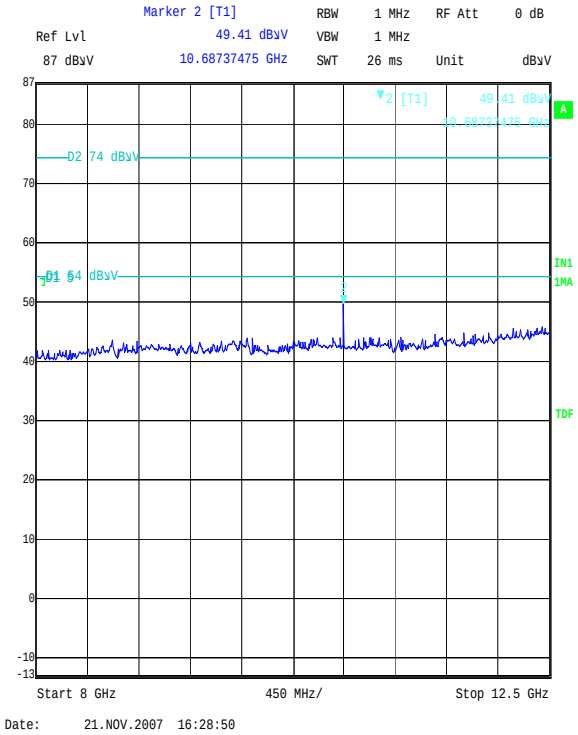
Idle Mode Radiated Spurious Emissions (Continued)



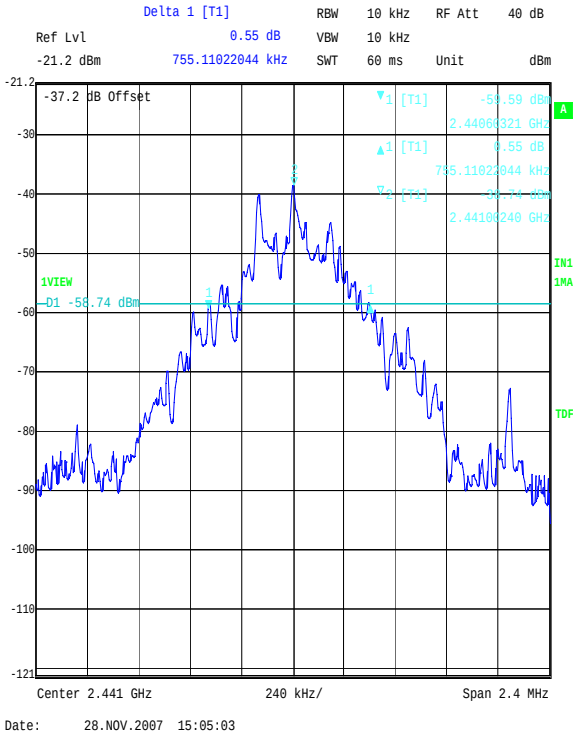
Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

7.2.4. Transmitter 20 dB Bandwidth

The EUT was configured for 20 dB bandwidth measurements, as described in section 9 of this report.

Results:

Transmitter 20 dB Bandwidth (kHz)	Limit (kHz)
755.110	None specified

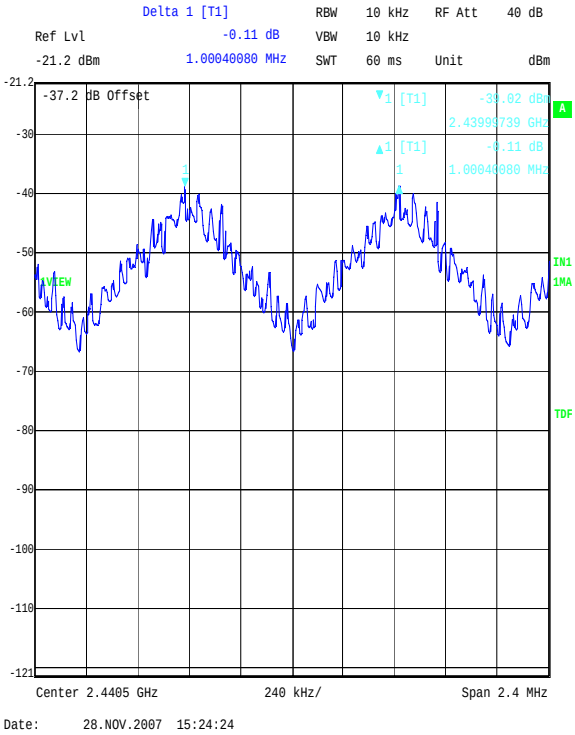


7.2.5. Transmitter Carrier Frequency Separation

The EUT was configured for carrier frequency separation measurements, as described in section 9 of this report.

Results:

Transmitter Carrier Frequency Separation (kHz)	Limit (> 20 dB or $^2/_3$ of 20 dB BW) (kHz)	Margin (kHz)	Result
1000.401	498.373	502.028	Complied



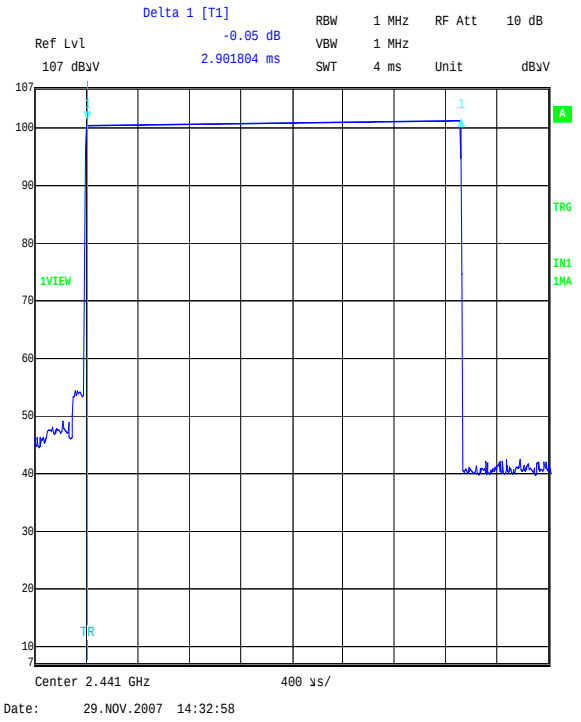
7.2.6. Transmitter Average Time of Occupancy

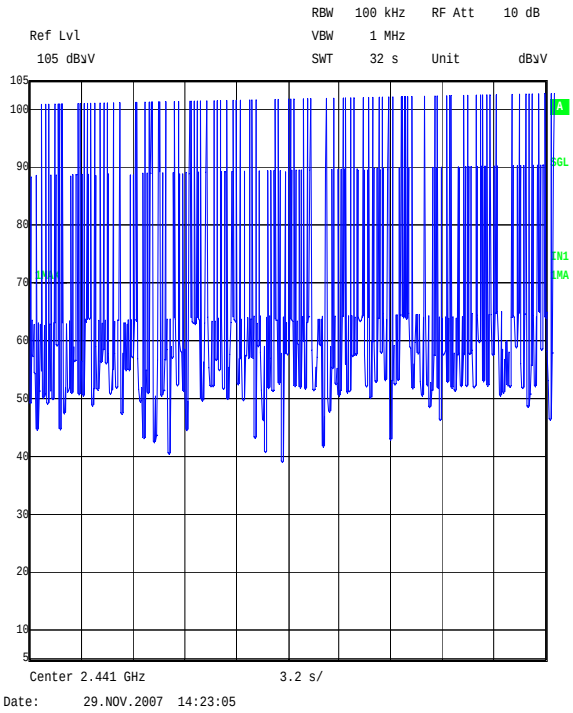
The EUT was configured for average time of occupancy measurements, as described in section 9 of this report.

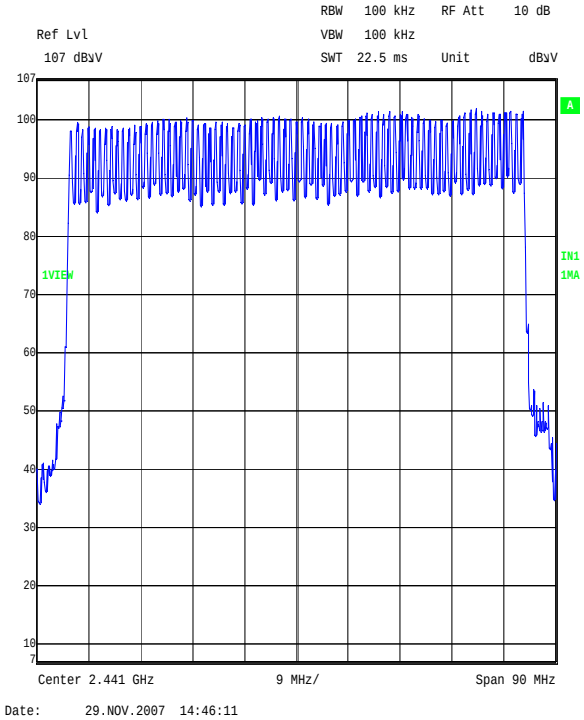
Results:

Emission Width (μs)	Number of Hops in 31.6 Seconds	Average Time of Occupancy (s)	Limit (s)	Margin (s)	Result
2901.804	96	0.278573	0.4	0.121427	Complied

Transmitter Average Time of Occupancy (Continued)







7.2.7. Transmitter Maximum Peak Output Power

The EUT was configured for transmitter peak output power measurements, as described in section 9 of this report.

Tests were performed to identify the transmitter maximum peak output power (EIRP) of the EUT.

Results:

Channel	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	7.0	30.0	23.0	Complied
Middle	7.4	30.0	22.6	Complied
Top	6.4	30.0	23.6	Complied

Note(s):

1. *These tests were performed radiated; therefore the EUT antenna gain is encompassed in the final result and not measurable.*

7.2.8. Transmitter Radiated Emissions

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

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

Results:

Electric Field Strength Measurements: 30 MHz to 1000 MHz (Emissions Occurring in the Restricted Bands)

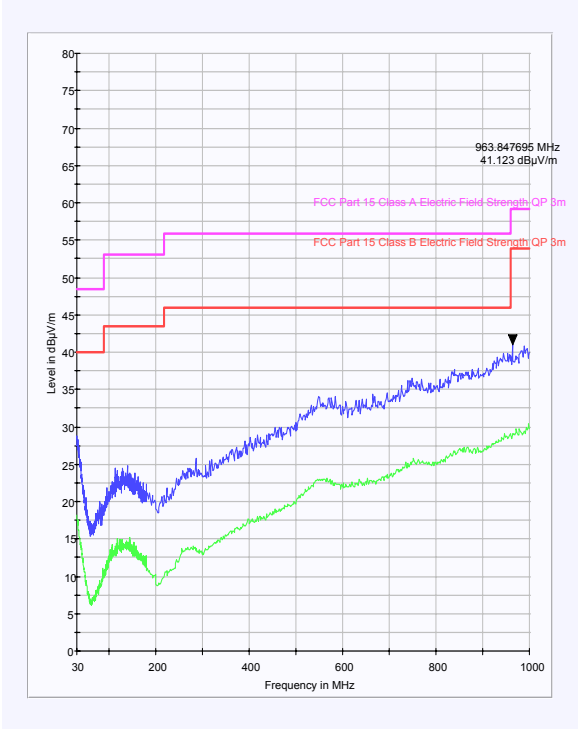
Top Channel

Frequency (MHz)	Antenna Polarity	Peak Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
963.848	Vertical	41.1	54.0	12.9	Complied

Note(s):

1. *The preliminary scans showed similar emission levels for each mode below 1 GHz, therefore final radiated emissions measurements were performed with the EUT set to the top channel only.*
2. *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 quasi-peak limit as this is the worst case.*

Transmitter Radiated Emissions: (Continued)



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

Transmitter Radiated Emissions: (Continued)

Results:

Electric Field Strength Measurements (Frequency Range: 1 to 25 GHz)

Highest Peak Level: Bottom Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBµV)	Transducer Factor (dB)	Actual Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4.804	Horizontal	61.5	-3.2	58.3	74.0	15.7	Complied

Highest Average Level: Bottom Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBµV)	Transducer Factor (dB)	Actual Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4.804	Horizontal	53.3	-3.2	50.1	54.0	3.9	Complied

Highest Peak Level: Middle Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBµV)	Transducer Factor (dB)	Actual Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4.882	Horizontal	59.9	-3.6	56.3	74.0	17.7	Complied

Highest Average Level: Middle Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBµV)	Transducer Factor (dB)	Actual Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4.882	Horizontal	51.0	-3.6	47.4	54.0	6.6	Complied

Highest Peak Level: Top Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBµV)	Transducer Factor (dB)	Actual Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4.960	Horizontal	56.8	-3.7	53.1	74.0	20.9	Complied

Highest Average Level: Top Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBµV)	Transducer Factor (dB)	Actual Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4.960	Horizontal	47.2	-3.7	43.5	54.0	10.5	Complied

Transmitter Radiated Emissions: (Continued)

Results:

Highest Peak Level: Hopping Mode

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.822	Horizontal	61.2	-3.6	57.6	74.0	16.4	Complied

Highest Average Level: Hopping Mode

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.911	Horizontal	45.3	-3.7	41.6	54.0	12.4	Complied

Note(s):

1. *The emission at 10.687 GHz is an ambient that is not produced by the EUT and, therefore was not measured.*
2. *The emission at 1.695 GHz is an ambient that is not produced by the EUT and, therefore was not measured.*

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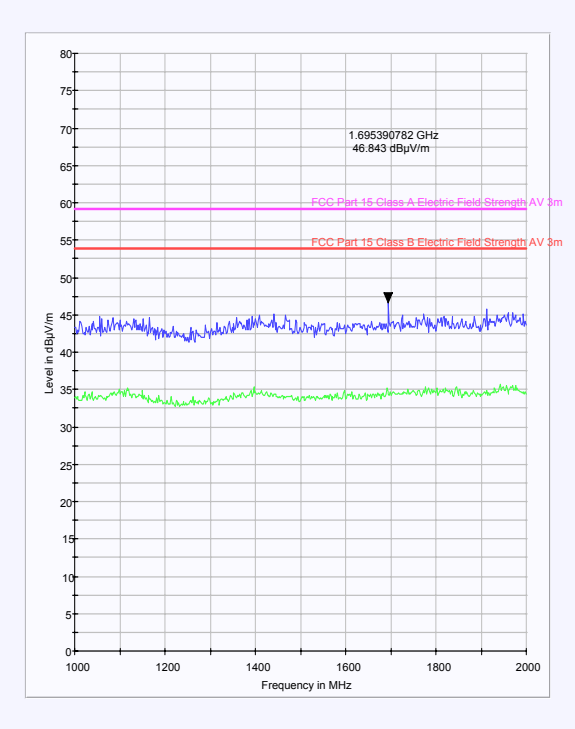
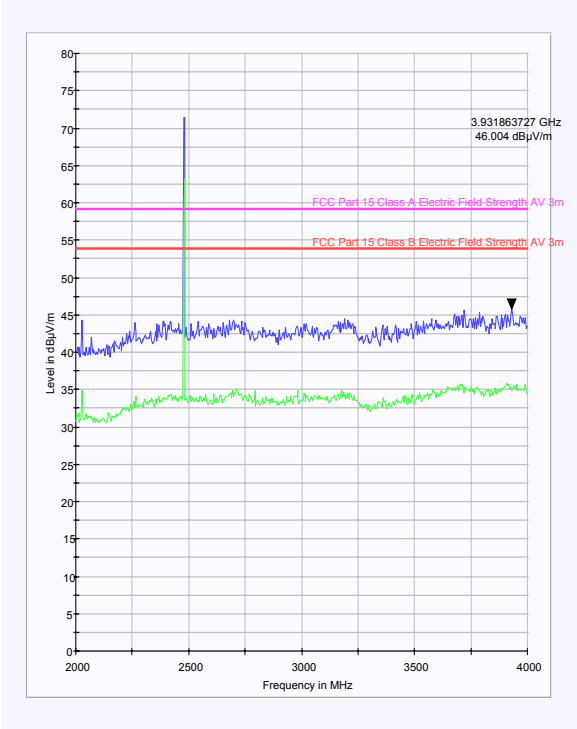
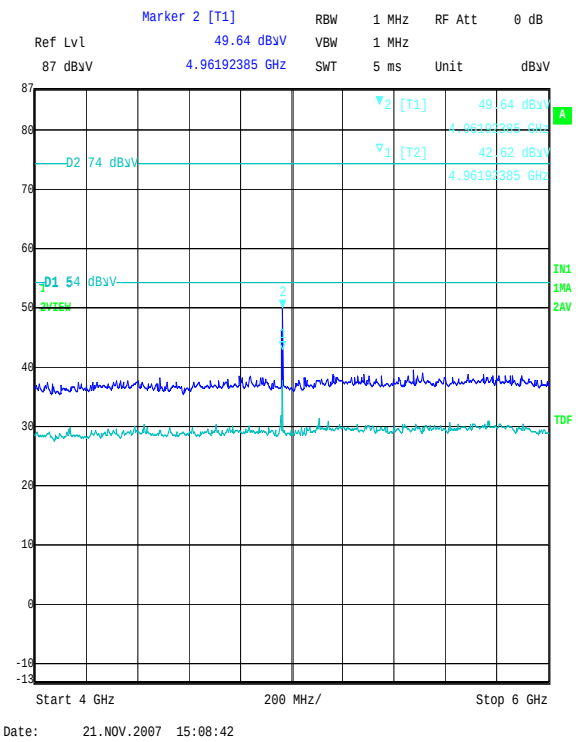
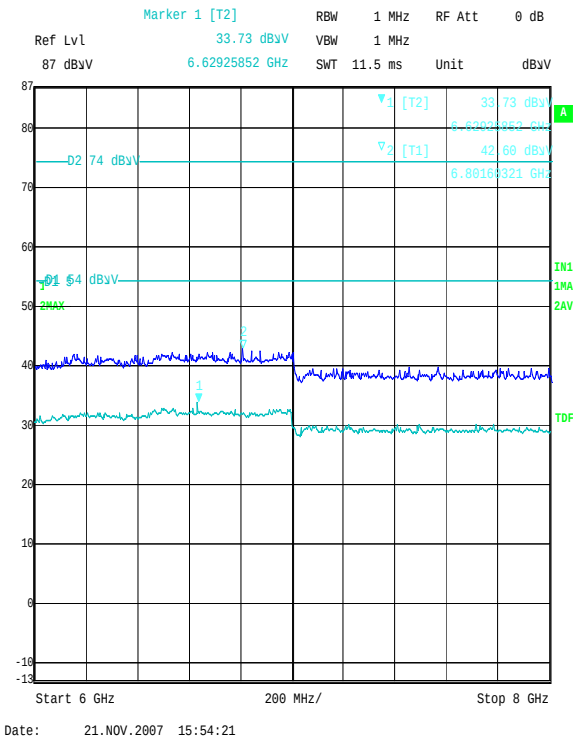
Transmitter Radiated Emissions: (Continued)



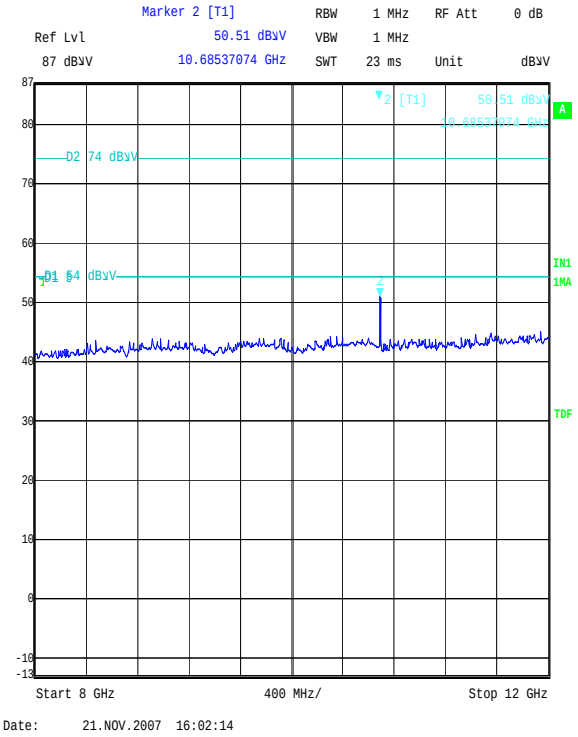


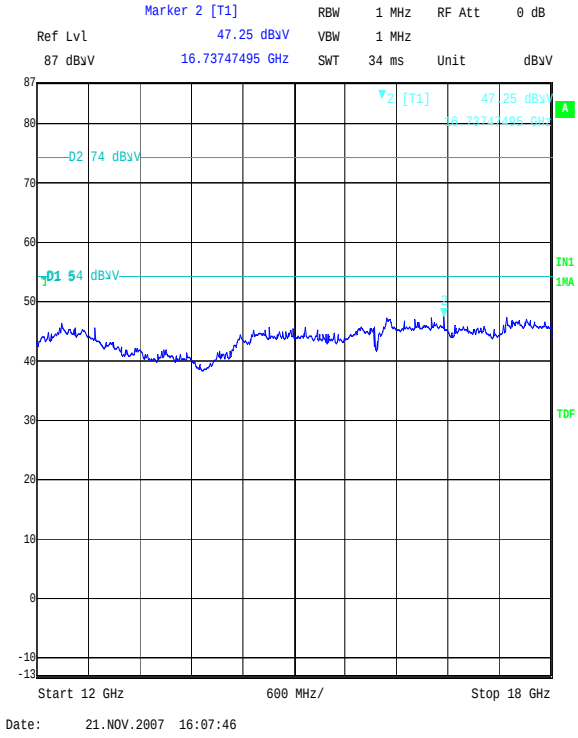


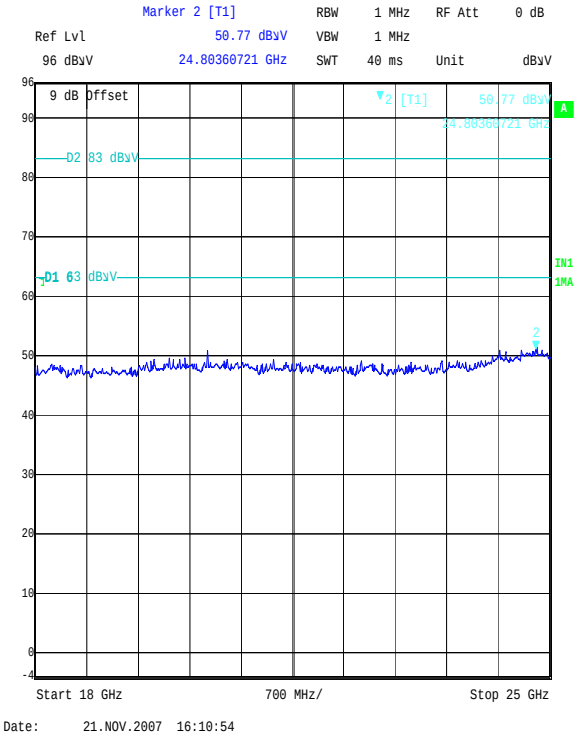


Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Transmitter Radiated Emissions: (Continued)







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

7.2.9. Transmitter Band Edge Radiated Emissions

The EUT was configured for band edge compliance of radiated emission measurements, as described in section 9 of this report.

Tests were performed to identify the maximum radiated band edge emissions.

Results:

Electric Field Strength Measurements

Peak Power Level Hopping Mode:

Frequency (GHz)	Antenna Polarity	Detector Level (dBµV)	Transducer Factor (dB)	Actual Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2.4000	Horizontal	60.4	-6.4	54.0	81.3*	27.3	Complied
2.4835	Horizontal	65.6	-8.0	57.6	74.0	16.4	Complied

Average Power Level Hopping Mode:

Frequency (GHz)	Antenna Polarity	Detector Level (dBµV)	Transducer Factor (dB)	Actual Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2.4835	Horizontal	39.5	-8.0	31.5	54.0	23.5	Complied

Note(s):

1. ** -20 dBc limit*

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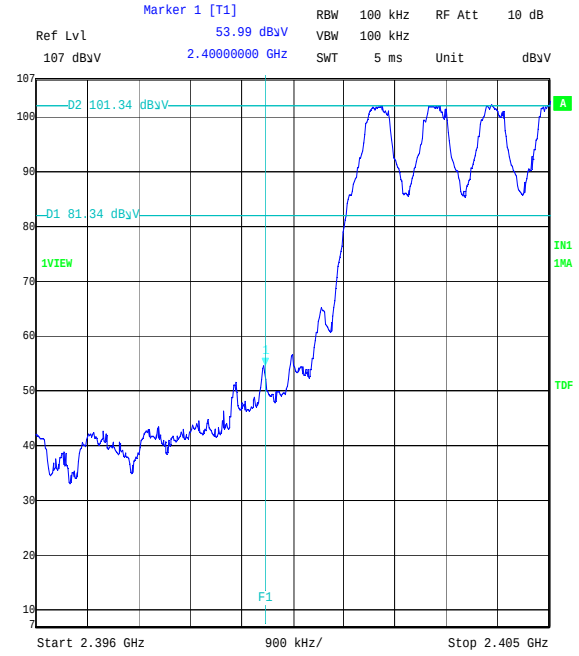
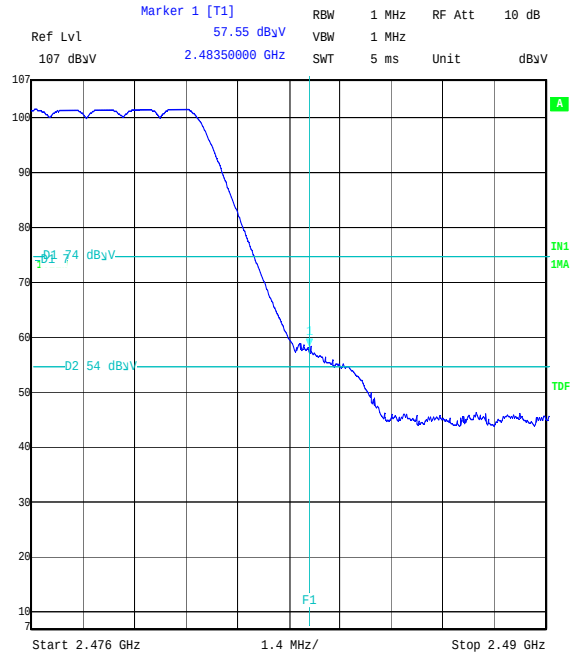
To: FCC Part 15.247: 2006 (Subpart C), RSS-210 Issue 7 June 2007 & RSS-Gen Issue 2 June 2007

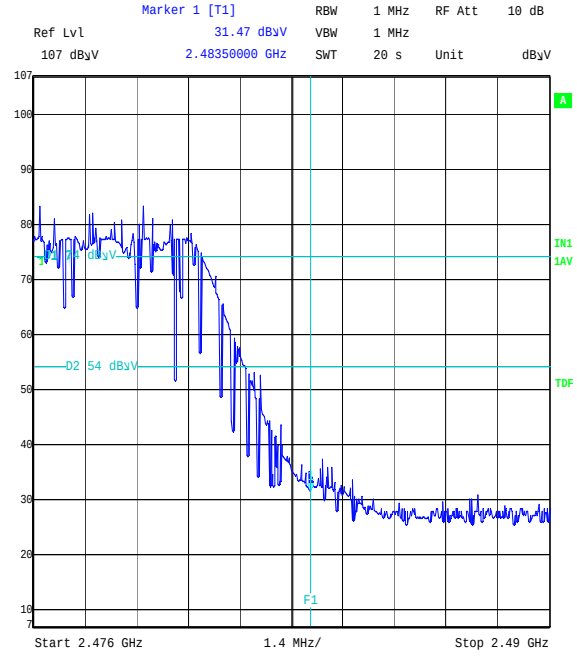
Transmitter Band Edge Radiated Emissions: (Continued)



Title: 49596JD07 FCC15.247
Comment A: TX BAND EDGE HOPPING BOT CHANNEL PEAK
Date: 30.NOV.2007 15:09:02



Title: 49596JD07 FCC15.247
Comment A: TX BAND EDGE HOPPING TOP CHANNEL PEAK
Date: 30.NOV.2007 14:45:37



Title: 49596JD07 FCC15.247
Comment A: TX BAND EDGE HOPPING TOP CHANNEL AVERAGE
Date: 30.NOV.2007 14:54:56

Transmitter Band Edge Radiated Emissions: (Continued)

Results:

Peak Power Level Static Mode:

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4000	Horizontal	61.0	-6.5	54.5	101.6*	47.1	Complied
2.4835	Horizontal	67.0	-8.0	59.0	74.0	15.0	Complied

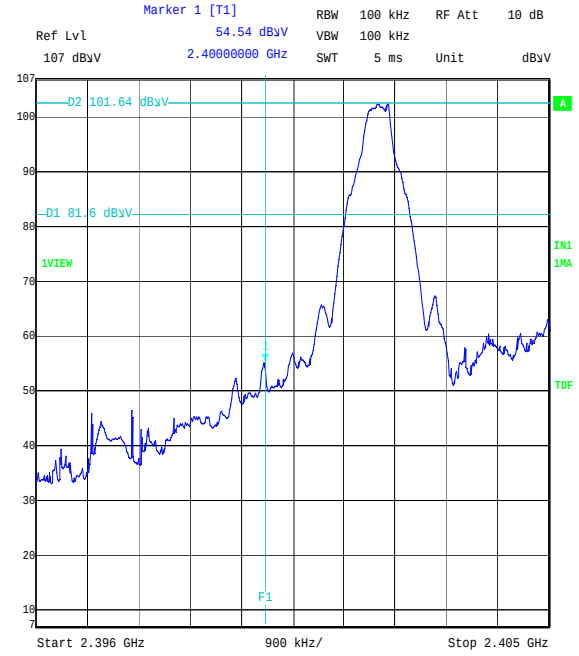
Average Power Level Static Mode:

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4835	Horizontal	53.0	-8.0	45.0	54.0	9.0	Complied

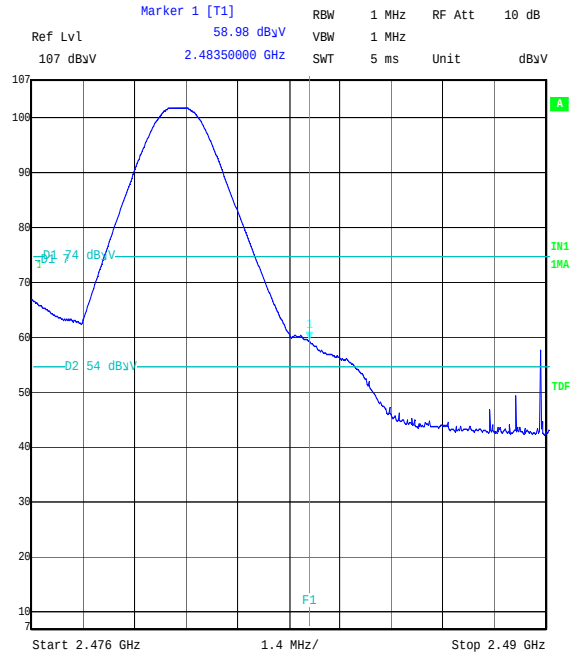
Note(s):

1. ** -20 dBc limit*

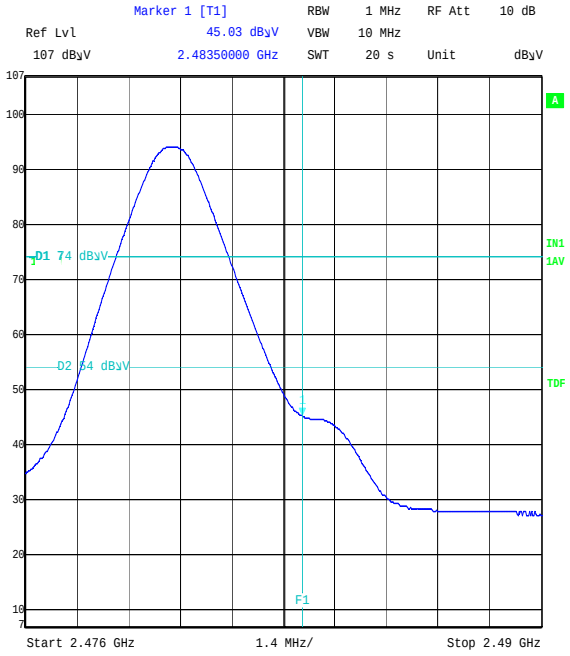
Transmitter Band Edge Radiated Emissions: (Continued)



Title: 49596JD07 FCC15.247
Comment A: TX BAND EDGE STATIC BOT CHANNEL PEAK
Date: 30.NOV.2007 15:18:48



Title: 49596JD07 FCC15.247
Comment A: TX BAND EDGE STATIC TOP CHANNEL PEAK
Date: 30.NOV.2007 14:22:12



Title: 49596JD07 FCC15.247
Comment A: TX BAND EDGE STATIC TOP CHANNEL AVERAGE
Date: 30.NOV.2007 14:31:29

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
Transmitter Maximum Peak Output Power	Not applicable	95%	+/- 2.94 dB
Transmitter Carrier Frequency Separation	Not applicable	95%	+/- 0.01 ppm
Transmitter Average Time of Occupancy	Not applicable	95%	+/- 10 %
20 dB Bandwidth	Not applicable	95%	+/- 0.12 %
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	+/- 5.26 dB
Radiated Spurious Emissions	1 GHz to 40 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. Radiated Emissions

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

Initial measurements covering the entire measurement band in the form of swept scans in a shielded enclosure were performed in order to identify frequencies on which the EUT was generating interference. This determined the frequencies on which the EUT should be re-measured in full on the open area test site. In order to minimise the time taken for the swept measurements, a peak detector was used in conjunction with the appropriate detector IF measuring bandwidth (see table below). Repetitive scans were performed to allow for emissions with low repetition rates.

The initial scans were performed using an antenna height of 1.5 m and a measurement distance of 3 m. Following the initial scans, graphs were produced giving an overview of the emissions from the EUT plotted against the appropriate specification limit. Any emission within 20 dB of the limit were then measured on the open area test site, except in cases where the noise floor was within 20 dB of the limit, in these cases the highest point of the noise floor was measured.

Where an emission fell inside a restricted band, measurements were made at the appropriate test distance using a measuring receiver with a quasi peak detector for measurements below 1000 MHz and an average and peak detector for measurements above 1000 MHz. A peak detector was used for all other measurements.

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.

All measurements on the open area test site were performed using broadband antennas in both vertical and horizontal polarisations.

On the open area test site, at each frequency where a signal was to be measured, the trace was maximised by rotating a turntable through 360°. The angle at which the maximum signal was observed was locked out. For frequencies below 1000 MHz the test antenna was varied in height between 1 m and 4 m in order to further maximise the target emission.

For frequencies above 1000 MHz where a horn antenna was used, height searching was performed to locate the optimal height of the horn with respect to the EUT. At this point the horn was locked off and the turntable was again rotated through 360° to maximise the target signal. It should be noted that the received signal from the EUT would diminish very quickly after it exits the beam width of the horn antenna, for this reason it may not be necessary to fully height search with the horn antennas.

Radiated Emissions (Continued)

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.

Scans were performed to the upper frequency limits as stated in section 15.33.

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 <1 GHz	Final Measurements ≥1 GHz
Detector Type:	Peak	Quasi-Peak (CISPR)	Peak / Average
Mode:	Max Hold	Not applicable	Max Hold
Bandwidth:	(120 kHz <1 GHz) (1 MHz ≥1 GHz)	120 kHz	1 MHz
Amplitude Range:	100 dB	100 dB	100 dB
Step Size:	Continuous sweep	Not applicable	Not applicable
Sweep Time:	Coupled	Not applicable	Not applicable

9.2. Carrier Frequency Separation / 20 dB Bandwidth

The EUT and spectrum analyser was configured for radiated measurements, and as per FCC Public Notice DA 00-705, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

To determine the bandwidth and separation of each transmission channel the measurement analyser was configured to measure two adjacent channels whilst the EUT was in hopping mode. The spectrum analyser was configured with a resolution bandwidth and video bandwidth greater than 1% of the frequency span.

The analyser was set for a maximum hold scan to capture the profile of the signal. The peak points on the two adjacent channels were noted and the separation between them recorded.

To determine the occupied bandwidth, a resolution bandwidth of 10 kHz was used, which is greater than 1% of the 20 dB bandwidth. A video bandwidth of at least the same value was used.

The analyser was set for a maximum hold scan to capture the profile of the signal. The peak level was then determined, and a reference line was drawn 20 dB below the peak level.

The bandwidth was determined at the points where the 20 dB reference line intercepted the power envelope of the emission.

9.3. Average Time of Occupancy

The EUT and spectrum analyser was configured for radiated measurements, and as per FCC Public Notice DA 00-705, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

First the maximum packet length was determined on the centre channel.

The measurement analyser was configured to the time domain mode by setting the span to zero with a sweep time sufficiently wide enough to measure one pulse.

The EUT was configured to operate in normal mode of operation. The pulse width of one transmission was then recorded. The measurement analyser was then configured in zero span (in the time domain) and the sweep time was set to 32 seconds (the closest allowable setting to 31.6 seconds). This 32 second period was determined by multiplying the number of channels the device operates over (79) by 0.4 seconds.

The number of transmissions within this period was noted and multiplied by the pulse width recorded earlier. This gives the maximum occupancy over 31.6 seconds.

9.4. Effective Isotropic Radiated Power (EIRP)

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 polarity. 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 horn antenna. 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

Effective Isotropic Radiated Power (EIRP) (Continued)

Circumstances where the signal generator could not produce the desired a power substitution was 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. Band Edge Compliance of RF Radiated Emissions

The EUT and spectrum analyser were configured as for radiated measurements and as per FCC Public Notice DA 00-705, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

To determine band edge compliance, the analyser resolution bandwidth was set to >= 1% of the analyser span. The video bandwidth was set to be ≥ to the resolution bandwidth. The sweep was set to auto and the detector to peak. The trace was set to max hold and a trace was produced.

A plot of the lower band edge of the allocated frequency band was produced. A marker was set to the level of the highest in band emission with a limit line set to 20 dB below this. The marker was then placed on the highest out of band emission (the specification states that either the band edge level must be measured or the highest out of band emission, whichever is the greater). The plots show that the highest out of band emission complies with the -20 dBc limit.

The above procedure was then repeated for the upper band edge except that, as the upper band edge fell on a restricted band edge (as defined in section 15.205(a)), the limit for the restricted band was applied instead of the -20 dBc limit, i.e. the general limits defined in section 15.209(a).

Final measurements were performed on the worst-case configuration as described in Part 15.31(i).

Appendix 1. Test Equipment Used

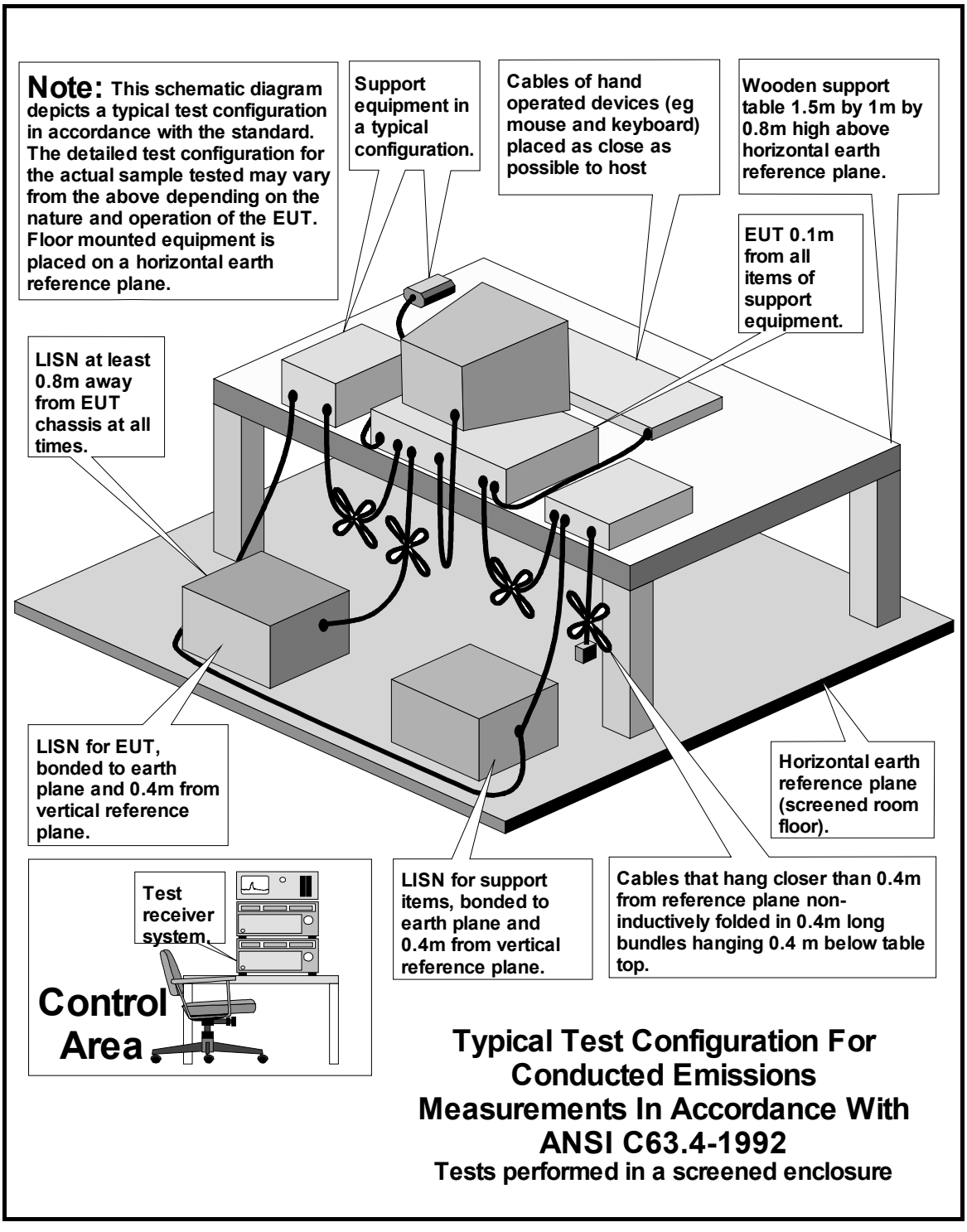
RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A028	Antenna	Eaton	91888-2	304	08 Jun 2006	36
A031	Antenna	Eaton	91889-2	557	08 Jun 2006	36
A1534	Pre Amplifier	Hewlett Packard	8449B OPT H02	3008A00405	Calibrated before use	-
A253	Antenna	Flann Microwave	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
A553	Antenna	Chase	CBL6111A	1593	01 Jan 2006	14
C1165	Cable	Rosenberger Micro-Coax	FA210A102000 7070	43189-1	05 Jun 2007	12
C1167	Cable	Rosenberger Micro-Coax	FA210A103000 7070	43190-01	05 Jun 2007	12
M024	Spectrum Monitor	Rohde & Schwarz	EZM	873 952/006	Calibrated before use	-
M044	Test Receiver	Rohde & Schwarz	ESVP	891 845/026	06 Mar 2007	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	20 Dec 2006	12
M1149	Bluetooth Test Set	Anritsu	MT8852A	6K00001529	Calibration not required	-
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	15 Aug 2007	12
M1273	Test Receiver	Rhode & Schwarz	ESIB 26	100275	20 Feb 2007	12
S201	Open Area Test Site	RFI	1	None	25 May 2007	12
S202	Site 2	RFI	2	S202-15011990	Calibrated before use	-

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

Appendix 2. Test Configuration Drawings

Drawing Reference Number	Title
DRG\49596JD07\EMICON	Test configuration for measurement of conducted emissions.
DRG\49596JD07\EMIRAD	Test configuration for measurement of radiated emissions.

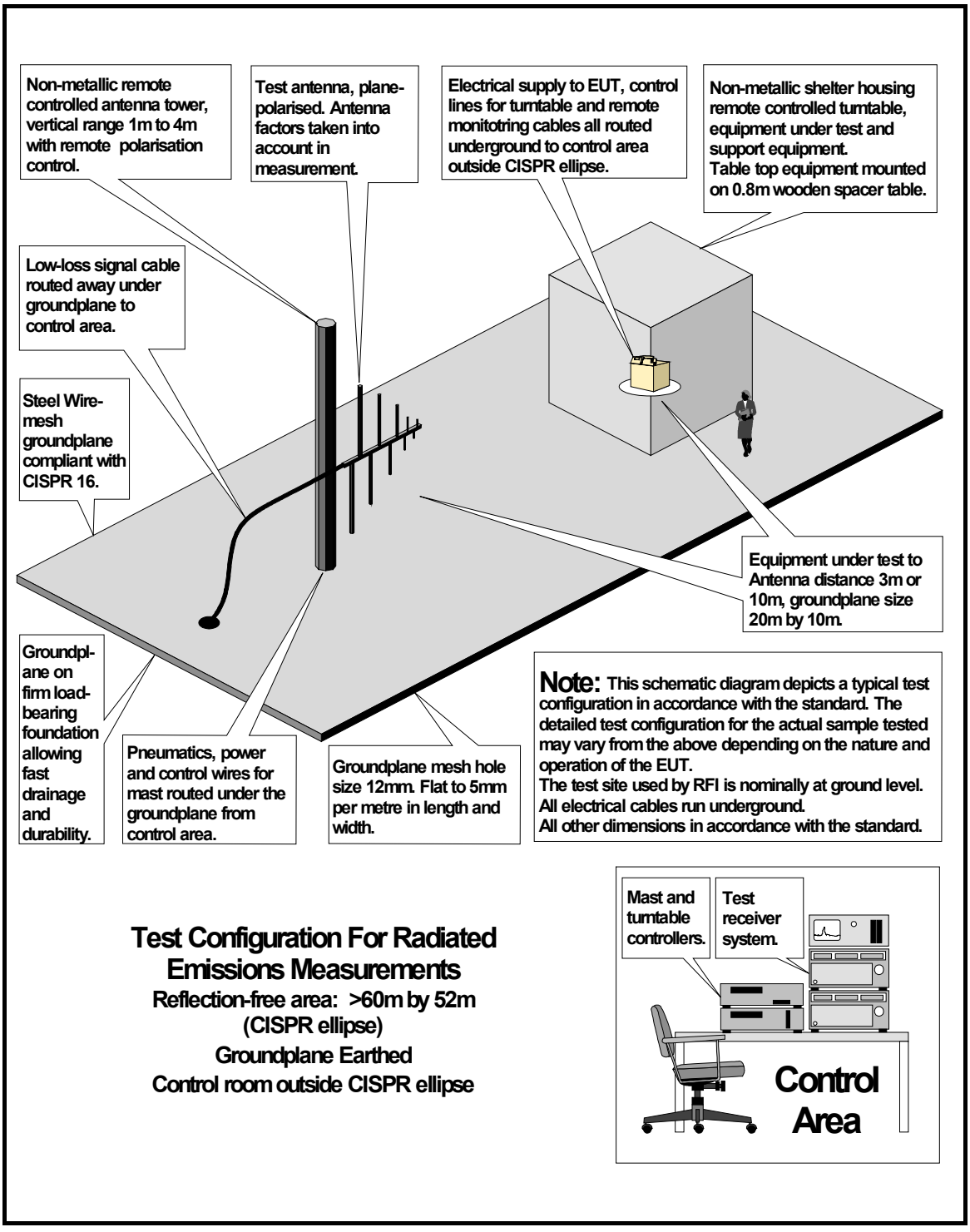
DRG\49596JD07\EMICON



Test of: Nokia BH-102

To: FCC Part 15.247: 2006 (Subpart C), RSS-210 Issue 7 June 2007 & RSS-Gen Issue 2 June 2007

DRG\49596JD07\EMIRAD



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