TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Wiz4com Technologies SAS
CT9A9W

To: FCC Part 24: 2006

Test Report Serial No:
RFI/RPTE1/RP49249JD03A

This Test Report Is Issued Under The Authority Of Michael Derby, Radio Performance Service Leader: 	
Tested By: Nigel Davison 	**Checked By: Michael Derby** 
Report Copy No: PDF01	
Issue Date: 06 July 2007	**Test Dates: 15 June 2007 to 22 June 2007**

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1. Client Information

Company Name:	Wiz4com Technologies SAS
Address:	9 Rue Maurice Trintignant Le Mans Cedex 9 72093 France
Contact Name:	Mr K Ben Ali

2. Equipment Under Test (EUT)

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

2.1. Identification of Equipment Under Test (EUT)

Description:	Cellular Mobile Phone
Brand Name:	Xenium 9@9W
Model Name or Number:	CT 9A9W
IMEI Number:	358233000063673 and 358233000054127
Hardware Version:	PR3
Software Version:	026 2000 2000 20000
FCC ID Number:	RXXCT9A9W
Country of Manufacture:	China
Date of Receipt:	15 June 2007

2.2. Accessories

The following accessories were supplied with the EUT:

Description:	2 Pin Euro Charger
Brand Name:	Phillips
Model Name or Number:	DSA-5W-05 FEU
Serial Number:	050065
Cable Length and Type:	1.2m, 2 Core
Connected to Port:	USB Port

Note: An adaptor was used to connect the European AC charger into a USA, 110 V, 60 Hz, mains socket.

2.3. Description of EUT

The equipment under test is a GSM and *Bluetooth* Device, using GSM 900/1800/1900 bands with integrated *Bluetooth*.

2.4. Modifications Incorporated in EUT

During the course of testing, the EUT was not modified.

2.5. Additional Information Related to Testing

Power Supply Requirement:	Nominal 110 V, 60 Hz AC Mains Supply Internal Battery Supply of 3.7 V		
Intended Operating Environment:	Within GSM Coverage		
Equipment Category:	GSM 1900/GPRS Class 10		
Type of Unit:	Mobile Transceiver		
Transmit Frequency Range:	1850 MHz to 1910 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 MHz to 1990 MHz		
Receive Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	512	1930.2
	Middle	660	1959.8
	Top	810	1989.8
EUT Transmitter EIRP (measured):	23.3 dBm		

2.6. Support Equipment

No support equipment was used to exercise the EUT during testing.

3. Test Results

Reference:	FCC Part 24 Subpart E: 2006 (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

There were no deviations from the test specification.

5. Operation of the EUT during Testing

5.1. Operating Modes

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

Transmitter tests were performed with the EUT in a GSM call, transmitting on the bottom, middle or top channel, as required.
A GSM test set was used to communicate with the EUT during the test.

Idle mode tests were performed with the EUT powered on but not transmitting.

5.2. Configuration and Peripherals

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

The SIM was in SIM 1 holder.

The AC charger was connected and charging.

The EUT was connected to a GSM test set via a wireless link.

6. Summary of Test Results

Devices with an External Antenna Connector

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: 2006 Section 15.107	AC Mains Input	Complied
Idle Mode Radiated Spurious Emissions	C.F.R. 47 FCC Part 15: 2006 Section 15.109	Enclosure	Complied
Transmitter Effective Isotropic Radiated Power (EIRP)	C.F.R. 47 FCC Part 24: 2006 Section 24.232	Antenna	Complied
Transmitter Frequency Stability (Temperature Variation)	C.F.R. 47 FCC Part 24: 2006 Section 24.235	Antenna Terminals	Complied
Transmitter Frequency Stability (Voltage Variation)	C.F.R. 47 FCC Part 24: 2006 Section 24.235	Antenna Terminals	Complied
Transmitter Occupied Bandwidth	C.F.R. 47 FCC Part 24: 2006 Section 24.238	Antenna Terminals	Complied
Transmitter Out of Band Conducted Emissions	C.F.R. 47 FCC Part 24: 2006 Section 2.1051/24.238	Antenna Terminals	Complied
Transmitter Band Edge Conducted Emissions	C.F.R. 47 FCC Part 24: 2006 Section 2.1051/24.238	Antenna Terminals	Complied
Transmitter Out of Band Radiated Emissions	C.F.R. 47 FCC Part 24: 2006 Section 2.1053/24.238	Antenna	Complied
Transmitter Band Edge Radiated Emissions	C.F.R. 47 FCC Part 2: 2006 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, UK.

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 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
0.426000	Live	30.1	57.3	27.2	Complied
0.474000	Live	28.7	56.4	27.7	Complied
0.526000	Live	27.7	56.0	28.3	Complied
0.622000	Live	29.9	56.0	26.1	Complied
0.718000	Live	28.6	56.0	27.4	Complied
0.778000	Live	26.1	56.0	29.9	Complied
0.906000	Live	26.3	56.0	29.7	Complied
0.986000	Live	27.0	56.0	29.0	Complied
1.146000	Live	26.8	56.0	29.2	Complied
1.334000	Live	14.9	56.0	41.1	Complied

Average Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.734000	Live	10.5	46.0	35.5	Complied

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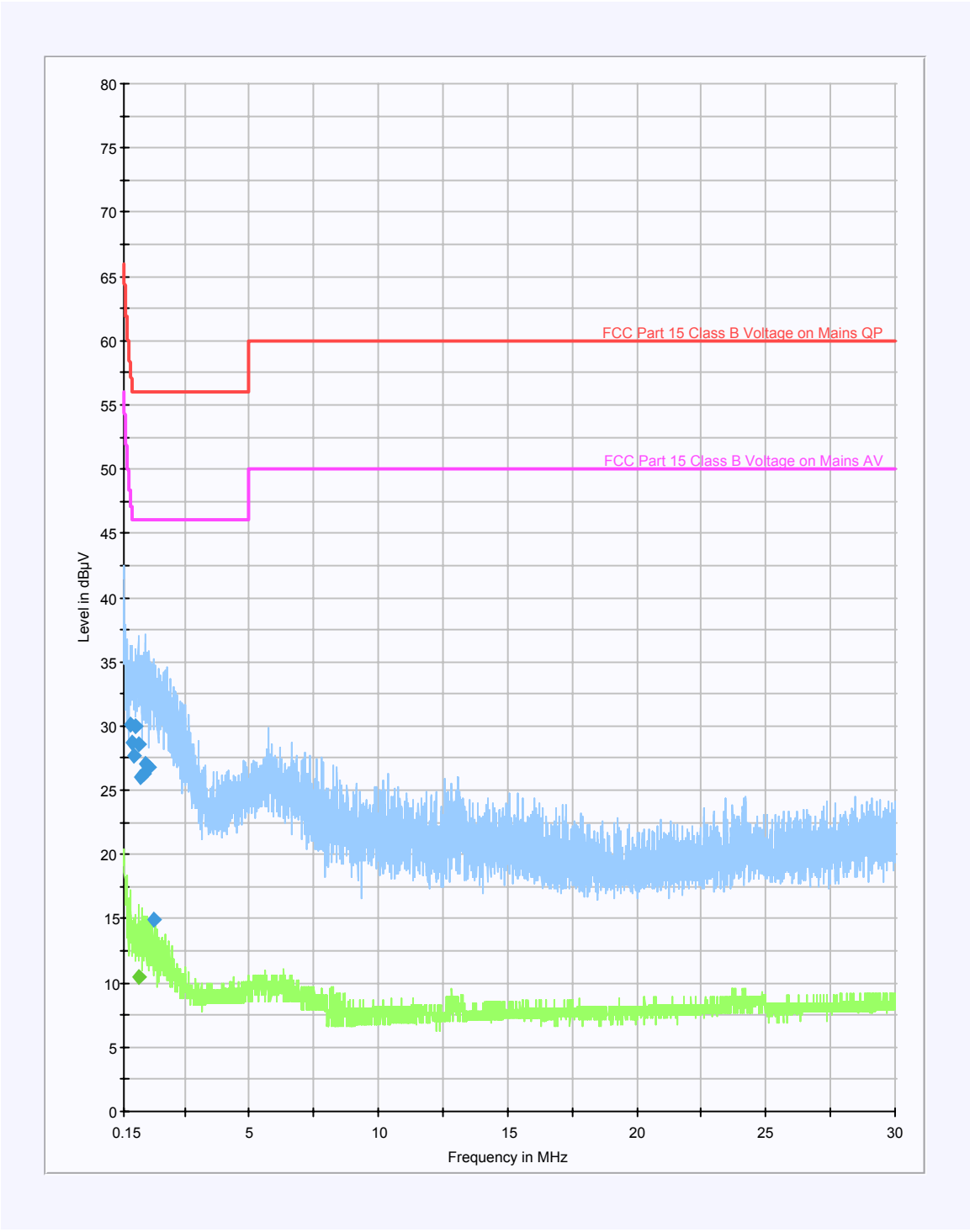
Idle Mode AC Conducted Spurious Emissions: Section 15.107 (Continued)



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

7.2.2. Receiver Radiated Spurious Emissions: Section 15.109

The EUT was configured for receiver 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:

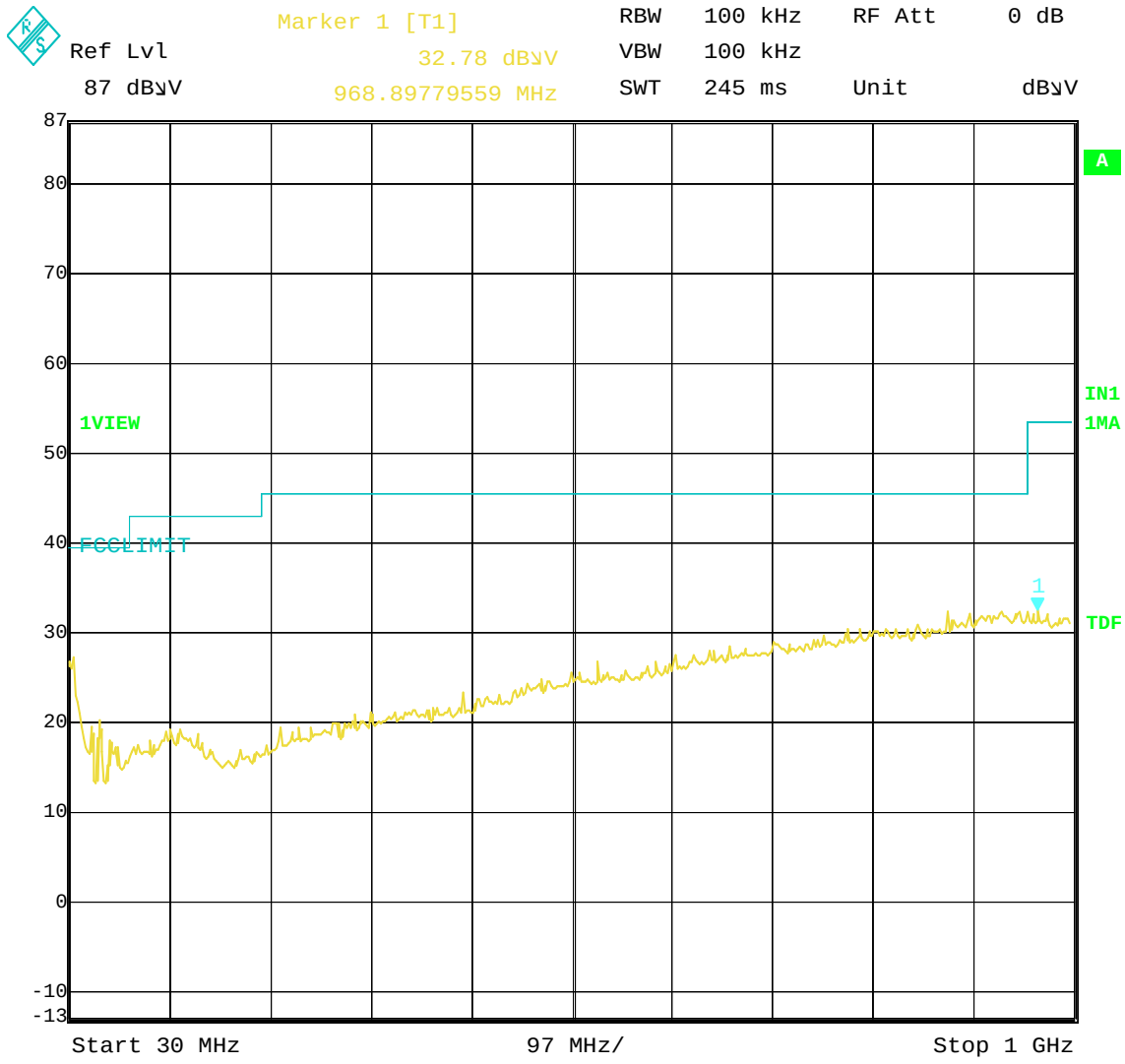
Electric Field Strength Measurements (Frequency Range: 30 MHz to 1000 MHz)

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
968.998	Horizontal	32.8	54.0	21.2	Complied

Note(s):

1. *No spurious emissions were detected above the noise floor of the measuring receiver; therefore, the highest peak noise floor reading was recorded as shown in the table above. The peak level is compared to the quasi-peak limit.*

Receiver Radiated Spurious Emissions: Section 15.109 (Continued)



Title: 49249JD05
Comment A: FCC15.109 GSM1900 IDLE MODE RADIATED EMISSIONS
Date: 15.JUN.2007 09:50:03

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

7.2.3. Receiver Radiated Spurious Emissions: Section 15.109

Results:

Electric Field Strength Measurements (Frequency Range: 1 GHz to 12 GHz)

Highest Peak Level:

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
12.168337	Horizontal	-13.7	31.6	27.4	45.3	74.0	28.7	Complied

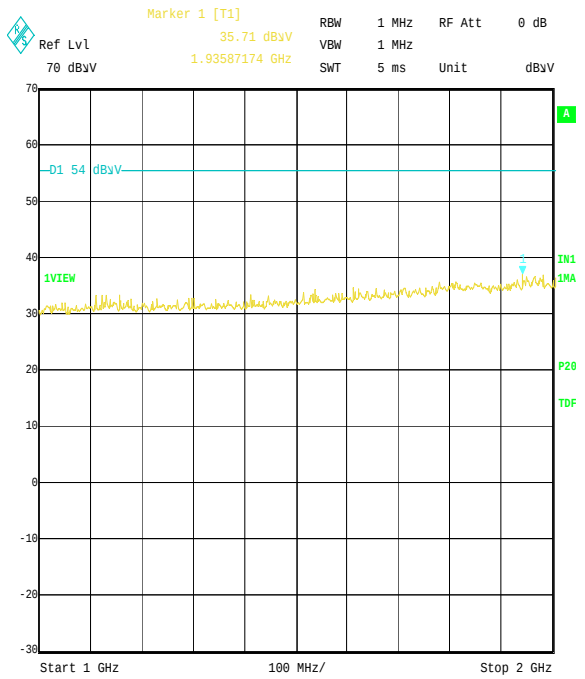
Average Level:

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
12.168337	Horizontal	-13.7	31.6	27.4	45.3	54.0	8.7	Complied

Note(s):

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

Receiver Radiated Spurious Emissions: Section 15.109 (Continued)



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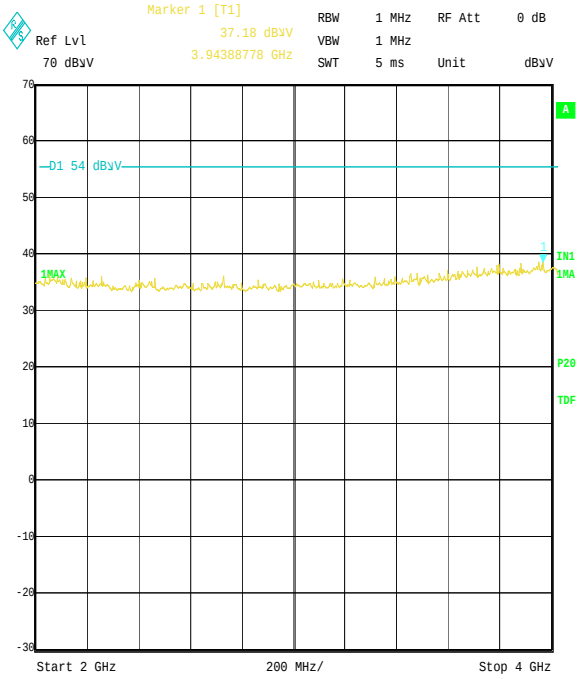
Date: 15.JUN.2007 11:22:38



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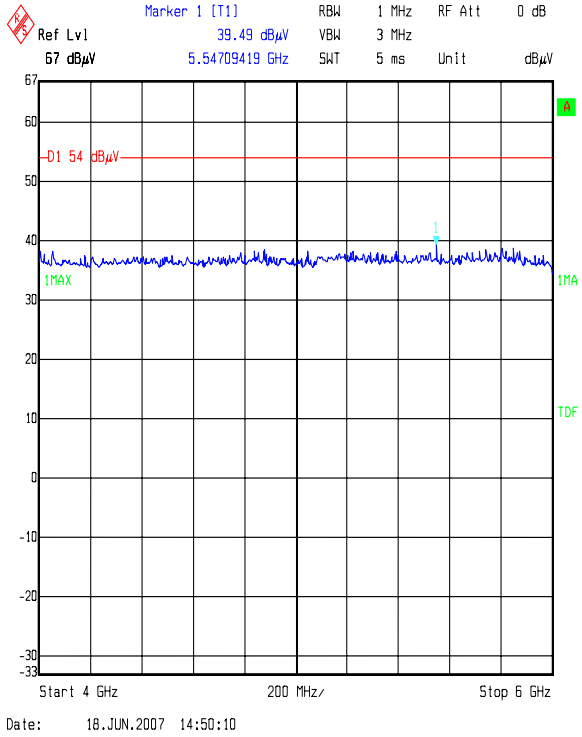
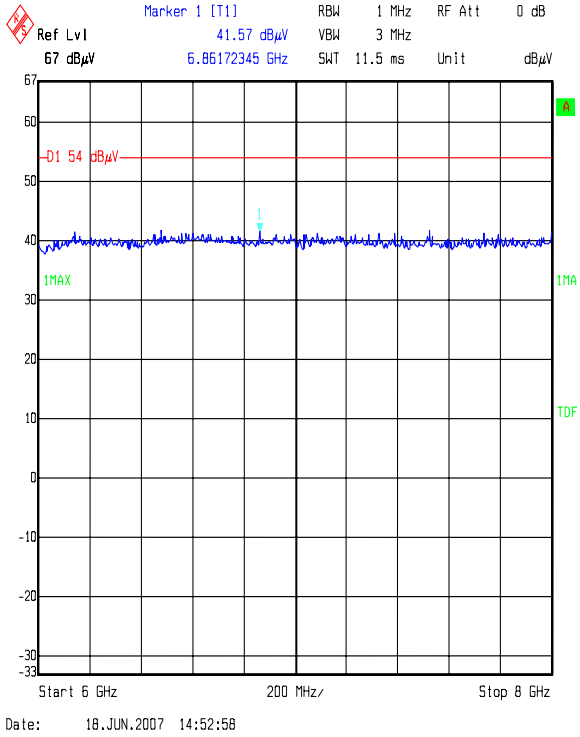
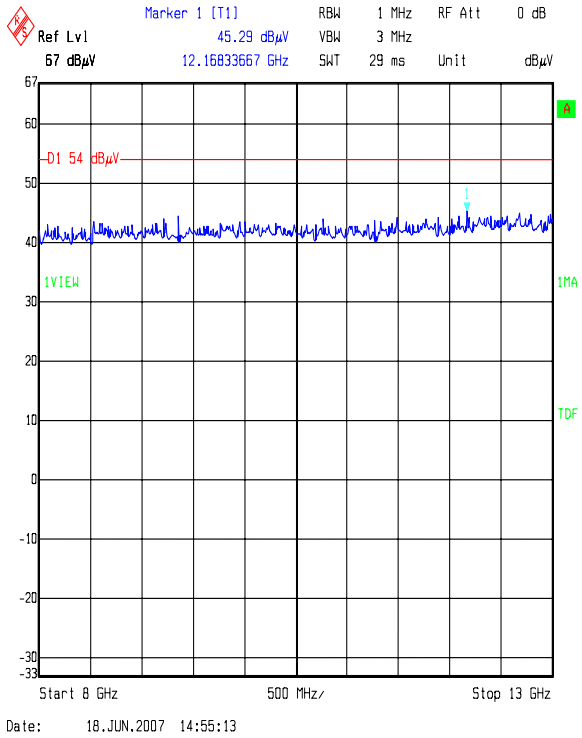
Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Receiver Radiated Spurious Emissions: Section 15.109 (Continued)







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

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

The EUT was configured 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	Horizontal	23.2	33.0	9.8	Complied
Middle	1879.8	Horizontal	23.1	33.0	9.9	Complied
Top	1909.8	Horizontal	23.3	33.0	9.7	Complied

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

The EUT was configured as for 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 (1850.2 MHz)

Temperature (ºC)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	3	1850.199997	1850.0	0.199997	Complied
-20	8	1850.199992	1850.0	0.199992	Complied
-10	10	1850.199990	1850.0	0.199990	Complied
0	11	1850.199989	1850.0	0.199989	Complied
10	8	1850.199992	1850.0	0.199992	Complied
20	5	1850.199995	1850.0	0.199995	Complied
30	20	1850.199980	1850.0	0.199980	Complied
40	20	1850.199980	1850.0	0.199980	Complied
50	17	1850.199983	1850.0	0.199983	Complied

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

Results:

Top Channel (1910.8 MHz)

Temperature (ºC)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	16	1909.799984	1910.0	0.200016	Complied
-20	15	1909.799985	1910.0	0.200015	Complied
-10	16	1909.799984	1910.0	0.200016	Complied
0	18	1909.799982	1910.0	0.200018	Complied
10	21	1909.799979	1910.0	0.200021	Complied
20	12	1909.799988	1910.0	0.200012	Complied
30	11	1909.799989	1910.0	0.200011	Complied
40	14	1909.799986	1910.0	0.200014	Complied
50	23	1909.799977	1910.0	0.200023	Complied

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

The EUT was configured for 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 (1850.2 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
3.3	10	1850.199990	1850	0.199990	Complied
3.7	3	1850.199997	1850	0.199997	Complied

Top Channel (1909.8 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
3.3	29	1909.799971	1910	0.200029	Complied
3.7	16	1909.799984	1910	0.200016	Complied

7.2.7. Transmitter Occupied Bandwidth: Section 24.238

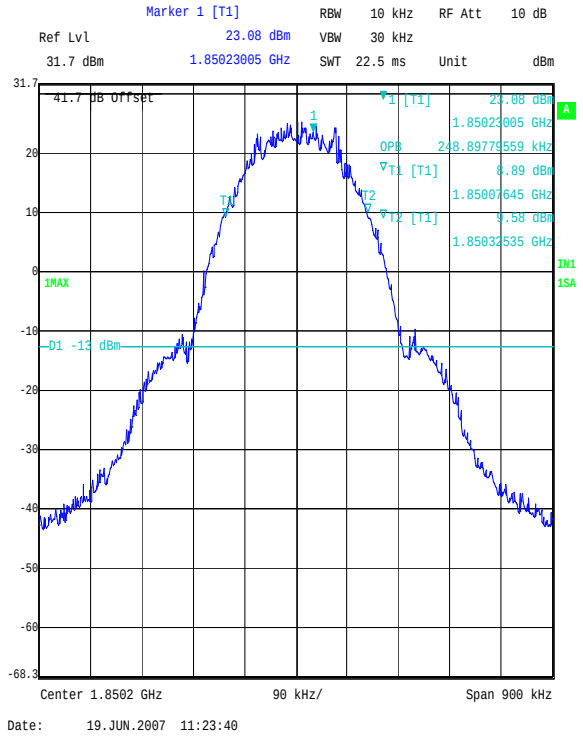
The EUT was configured for occupied bandwidth measurements, as described in section 9 of this report.

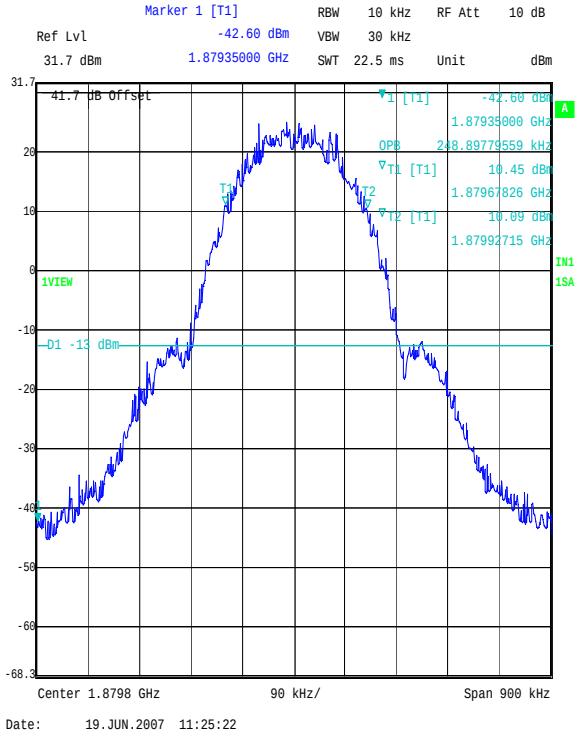
Tests were performed to identify the maximum bandwidth occupied by the fundamental frequency of the EUT.

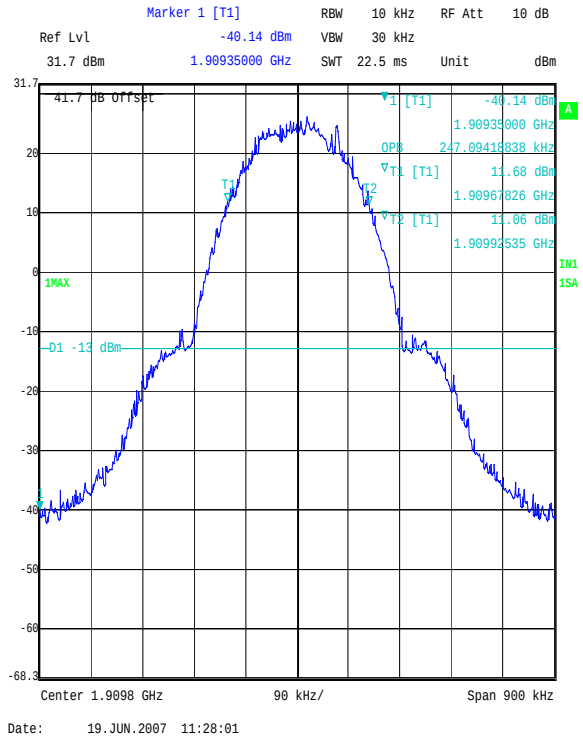
Results:

Channel	Frequency (MHz)	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	10.0	30.0	248.898
Middle	1879.8	10.0	30.0	248.898
Top	1909.8	10.0	30.0	247.094

Transmitter Occupied Bandwidth: Section 24.238 (Continued)







7.2.8. Transmitter Out of Band Conducted Emissions: Section 2.1051 & 24.238

The EUT was configured for transmitter conducted emission measurements, as described in section 9 of this report.

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

Results:

Bottom Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1847.000	-26.4	-13.0	13.4	Complied
1925.547	-28.9	-13.0	15.9	Complied
6893.787	-26.3	-13.0	13.3	Complied
12993.988	-27.5	-13.0	14.5	Complied

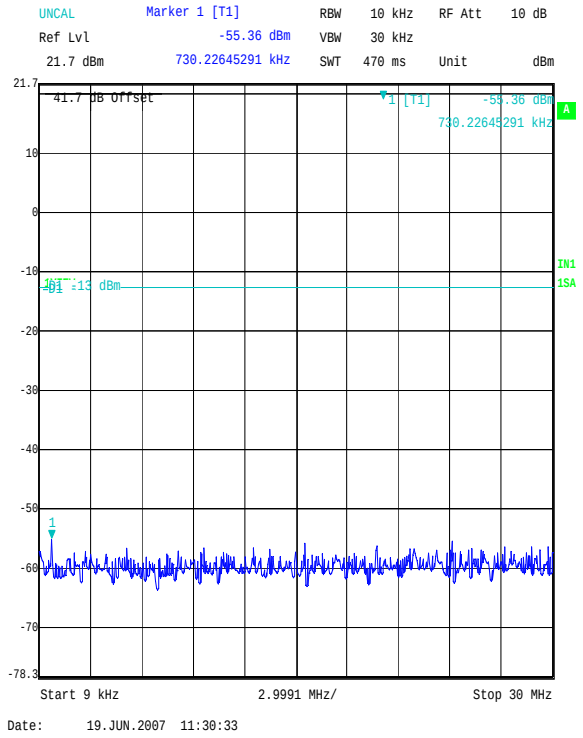
Middle Channel

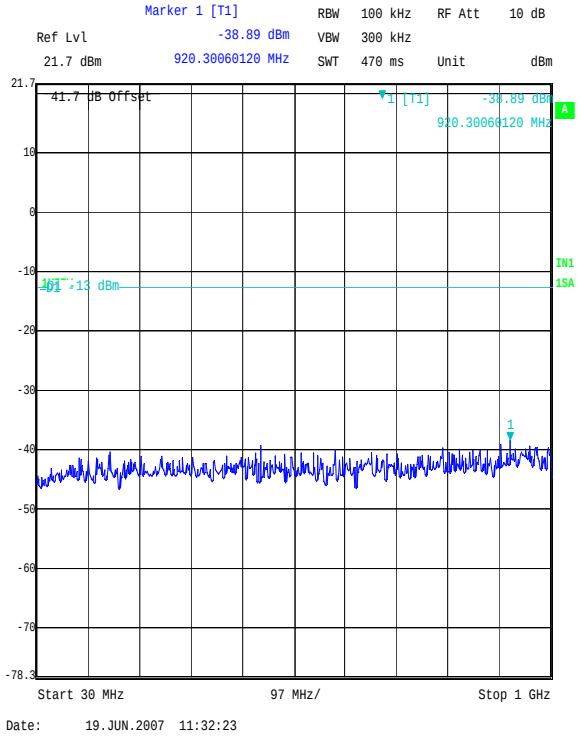
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1848.375	-29.8	-13.0	16.8	Complied
1926.136	-30.7	-13.0	17.7	Complied
6895.506	-26.2	-13.0	13.2	Complied
12993.158	-30.2	-13.0	17.2	Complied

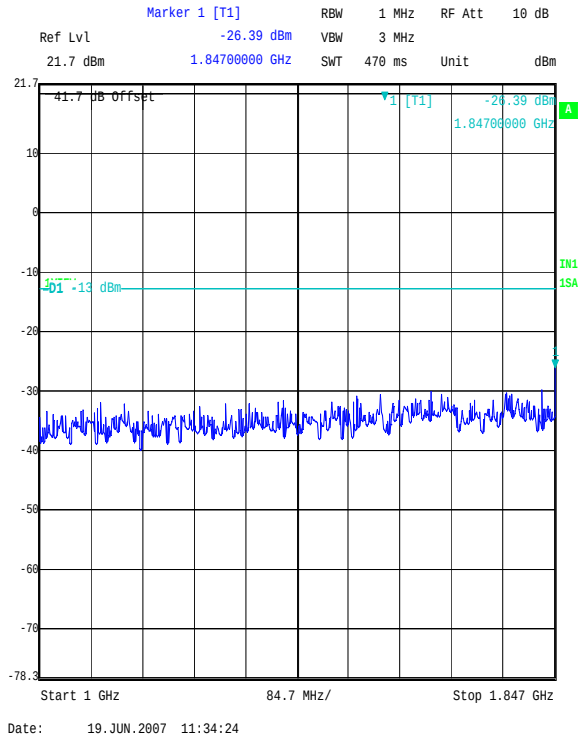
Top Channel

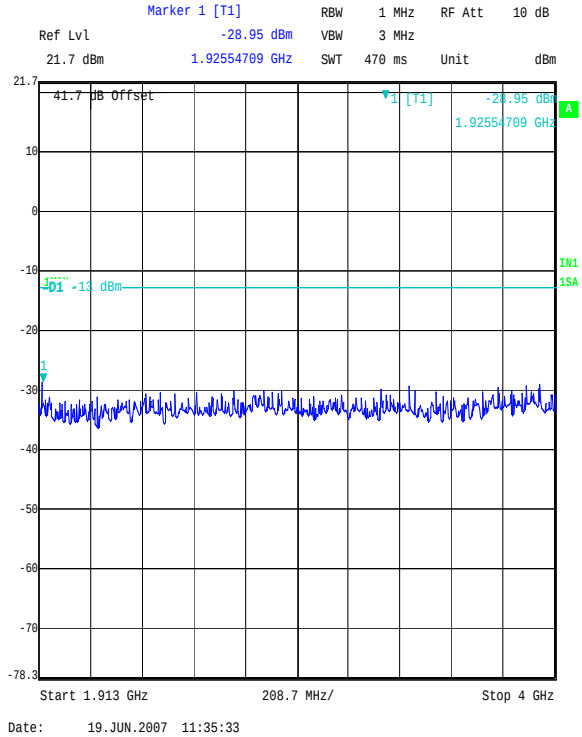
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1848.042	-31.3	-13.0	18.3	Complied
1927.607	-31.2	-13.0	18.2	Complied
6897.089	-25.5	-13.0	12.5	Complied
12993.944	-30.0	-13.0	17.0	Complied

Transmitter Out of Band Conducted Emissions: Section 2.1051 & 24.238 (Continued)



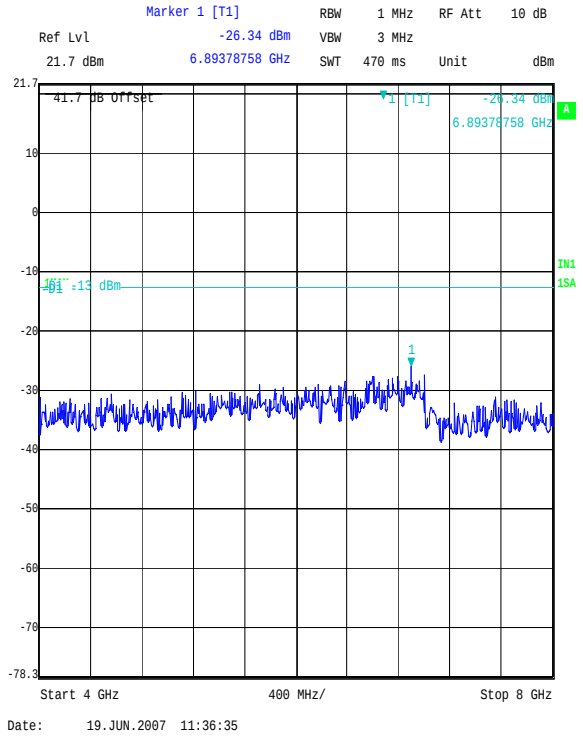


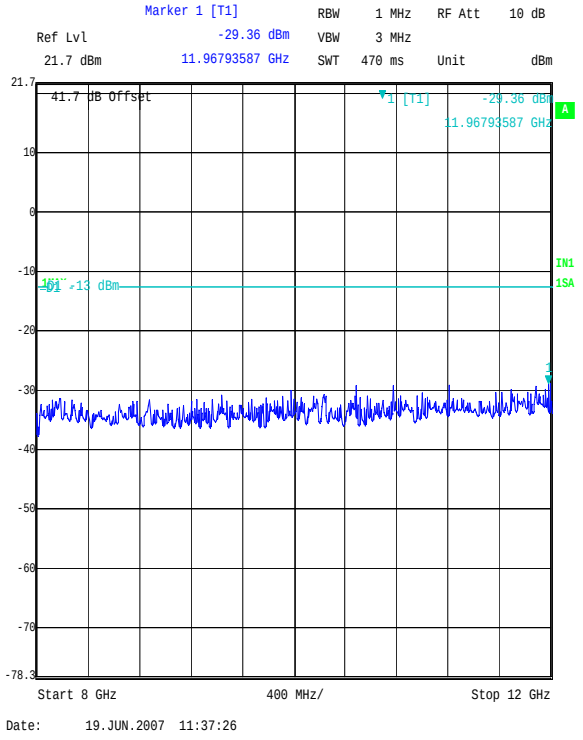


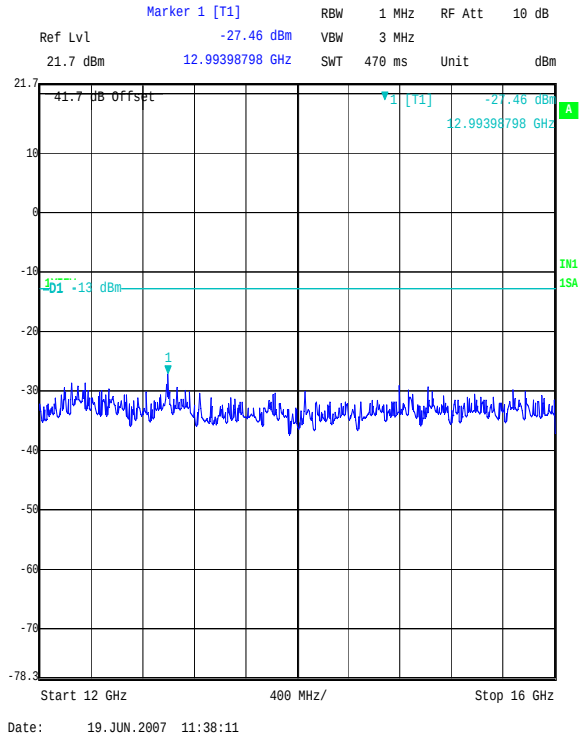


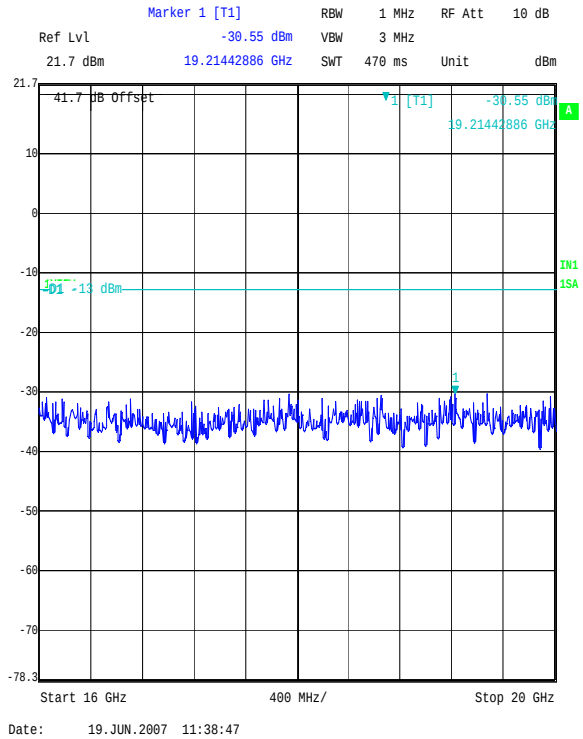
Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Transmitter Out of Band Conducted Emissions: Section 2.1051 & 24.238 (Continued)



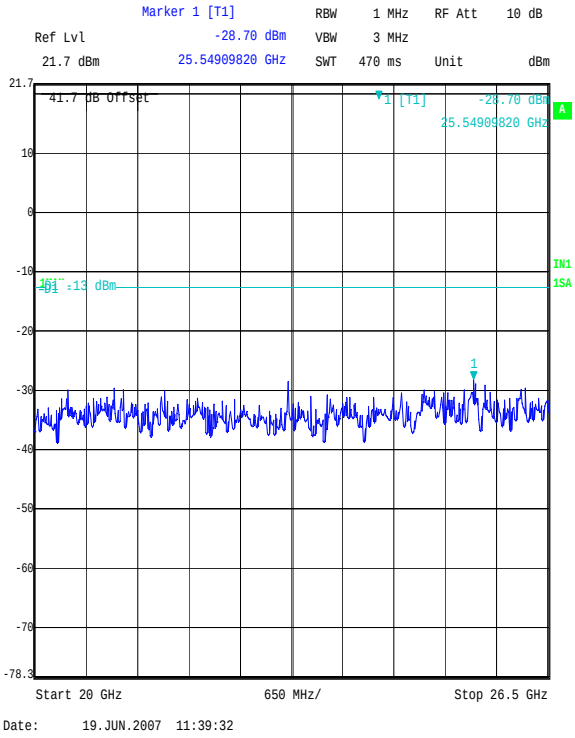






Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Transmitter Out of Band Conducted Emissions: Section 2.1051 & 24.238 (Continued)



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

Transmitter Out of Band Conducted Emissions: Section 2.1051 & 24.238 (Continued)

Integrated Power Over 1 MHz Strip Band: 1847 to 1848 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	239.954	6	204.540
2	212.249	7	185.036
3	276.924	8	214.547
4	206.561	9	237.940
5	223.468	10	238.275

Integrated Power Over 1 MHz Strip Band: 1848 to 1849 MHz

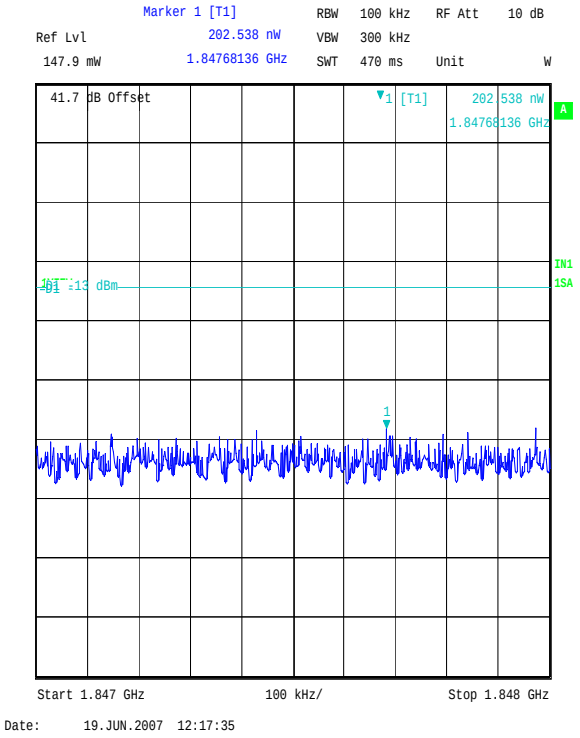
1st 1 MHz block immediately outside adjacent frequency block

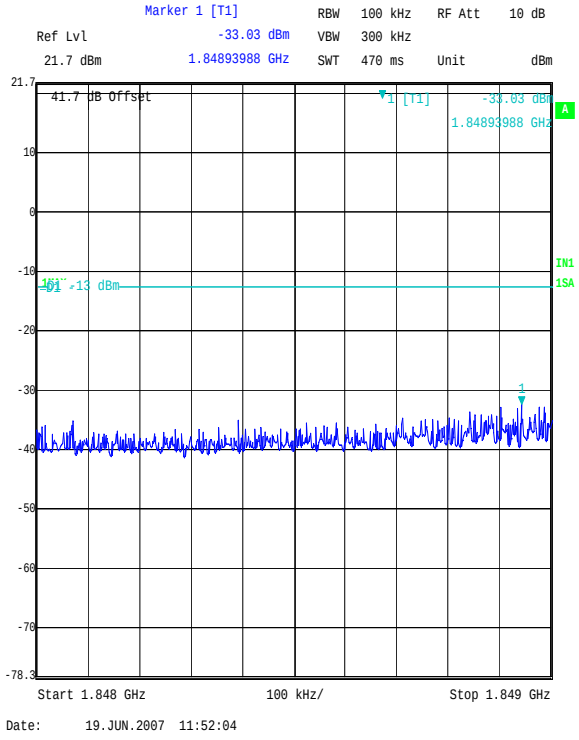
100 kHz Strip Number	Peak Power (nW/100 kHz)	100 kHz Strip Number	Peak Power (nW/100 kHz)
1	233.415	6	275.631
2	237.495	7	235.391
3	282.029	8	328.698
4	230.807	9	553.544
5	418.737	10	573.868

Results:

Band (MHz)	Peak Power (nW/MHz)	Peak Power (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Status
1847 to 1848	2239.494	-26.5	-13.0	13.5	Complied
1848 to 1849	3369.615	-24.7	-13.0	11.7	Complied

Transmitter Out of Band Conducted Emissions: Section 2.1051 & 24.238 (Continued)





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

Transmitter Out of Band Conducted Emissions: Section 2.1051 & 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	806.992	6	303.971
2	515.030	7	256.694
3	518.660	8	214.346
4	523.296	9	245.524
5	361.139	10	229.191

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

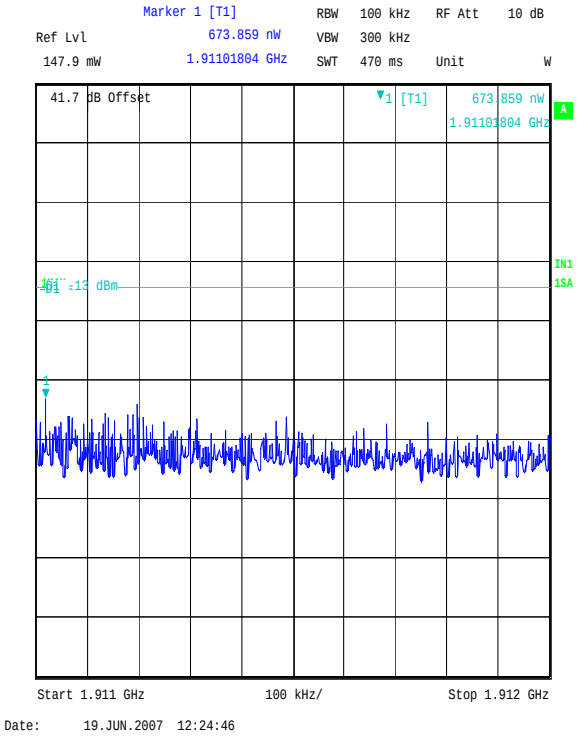
2nd 1 MHz block immediately outside adjacent frequency block

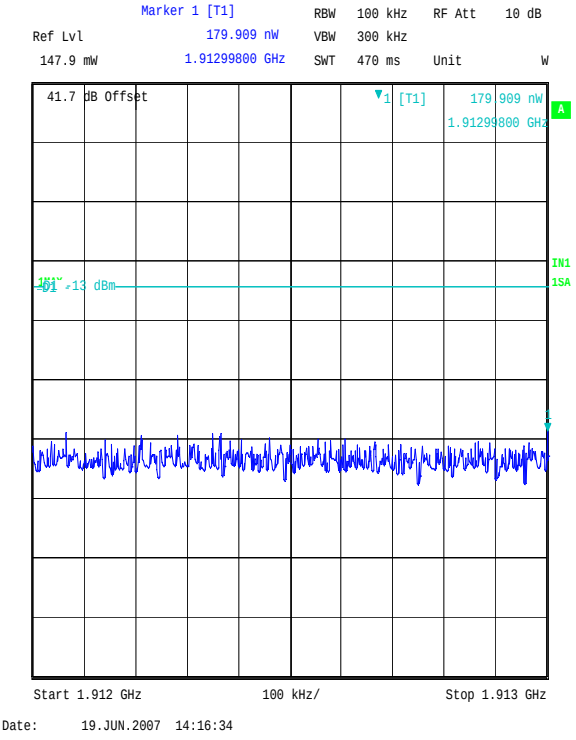
100 kHz Strip Number	Peak Power (nW/100 kHz)	100 kHz Strip Number	Peak Power (nW/100 kHz)
1	167.627	6	186.514
2	260.203	7	220.660
3	244.148	8	186.340
4	222.841	9	189.242
5	190.042	10	236.940

Results:

Band (MHz)	Peak Power (nW/MHz)	Peak Power (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Status
1911 to 1912	3974.843	-24.0	-13.0	11.0	Complied
1912 to 1913	2104.557	-26.8	-13.0	13.8	Complied

Transmitter Out of Band Conducted Emissions: Section 2.1051 & 24.238 (Continued)





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

7.2.9. Transmitter Conducted Emissions at Band Edges: Section 2.1051 & 24.238

The EUT was configured for transmitter conducted emission testing, as 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.

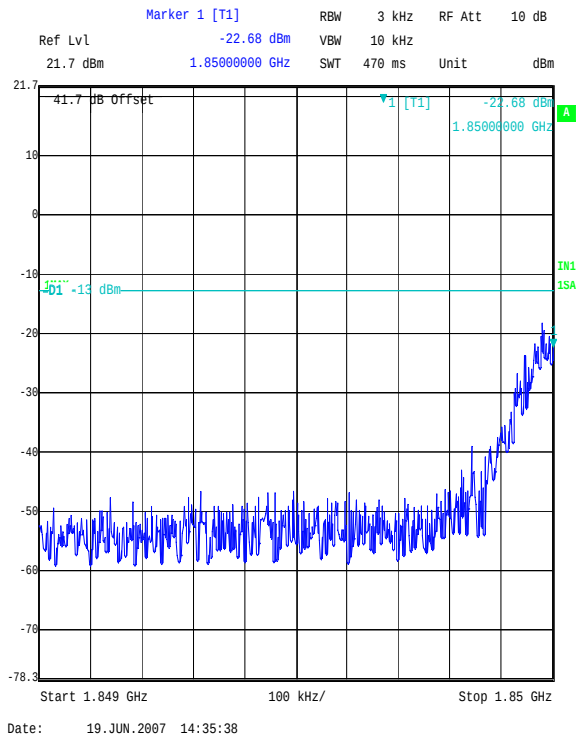
Results:

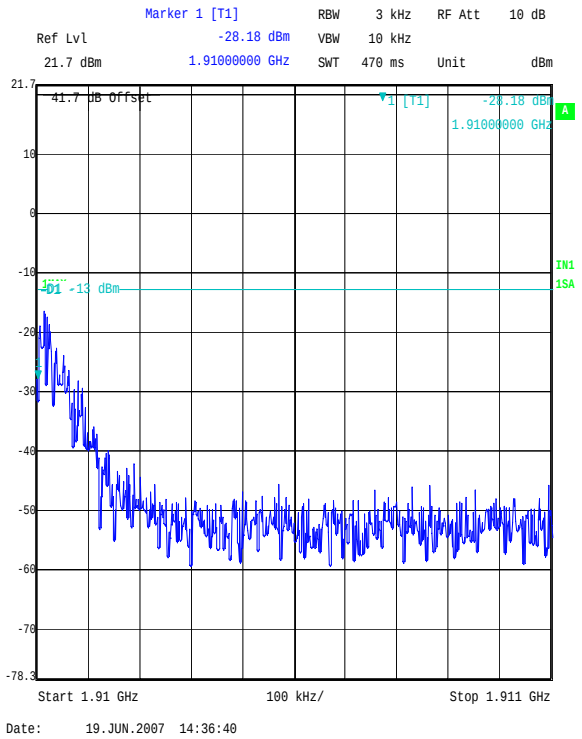
Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-59.5	-13.0	46.5	Complied

Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-23.2	-13.0	10.2	Complied





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

The EUT was configured for transmitter radiated emission 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
1651.248	-32.5	-13.0	19.5	Complied
3700.609	-32.1	-13.0	19.1	Complied

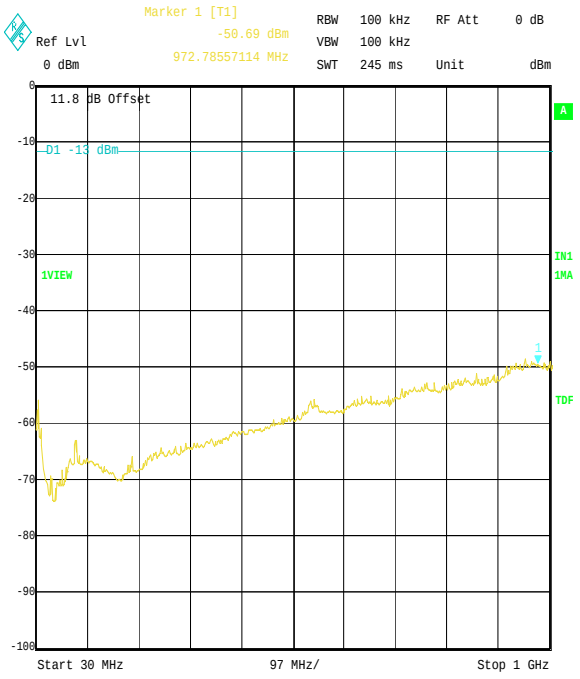
Middle Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1691.099	-32.8	-13.0	19.8	Complied
3759.353	-31.3	-13.0	18.3	Complied

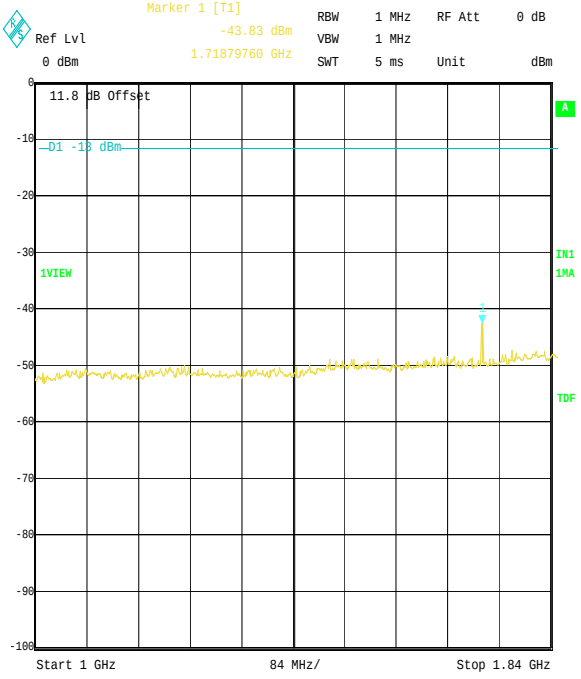
Top Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1719.137	-30.4	-13.0	17.4	Complied
3815.184	-31.9	-13.0	18.9	Complied

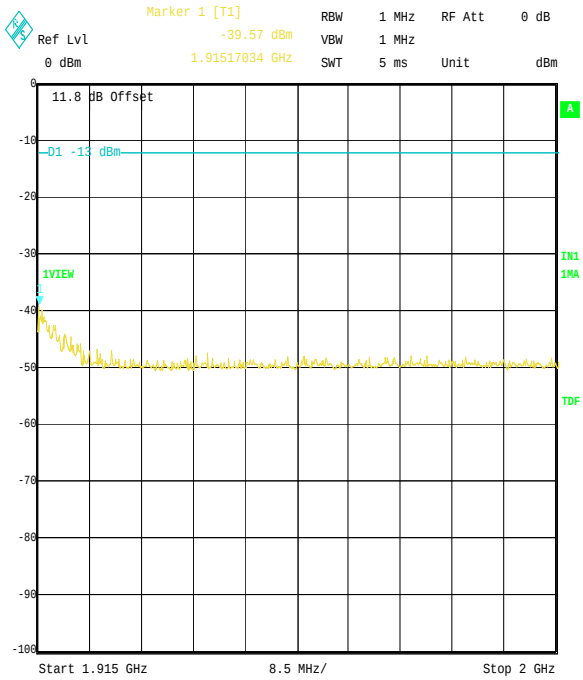
Transmitter Out of Band Radiated Emissions: Section 2.1053 & 24.238 (Continued)



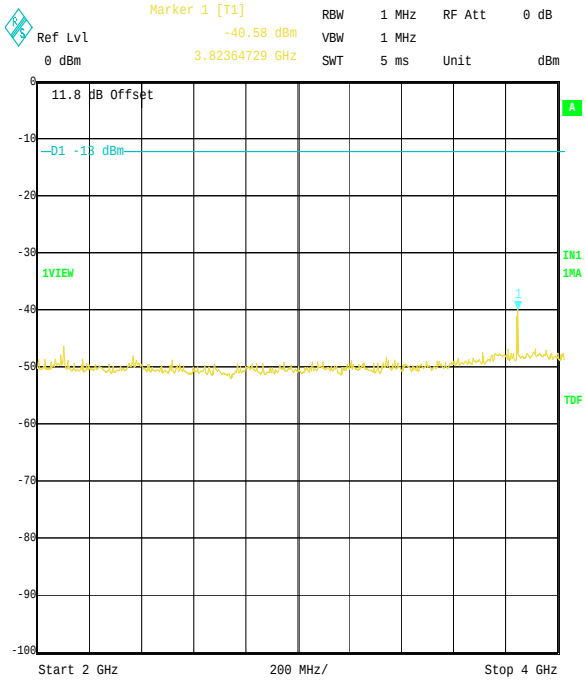
Title: 49249JD01
Comment A: FCC PART24 GSM1900 TX RADIATED EMISSIONS TOP CHANNEL
Date: 15.JUN.2007 12:27:14



Title: 49249JD05
Comment A: FCC PART24 GSM1900 TX RADIATED EMISSIONS TOP CHANNEL
Date: 15.JUN.2007 10:50:14



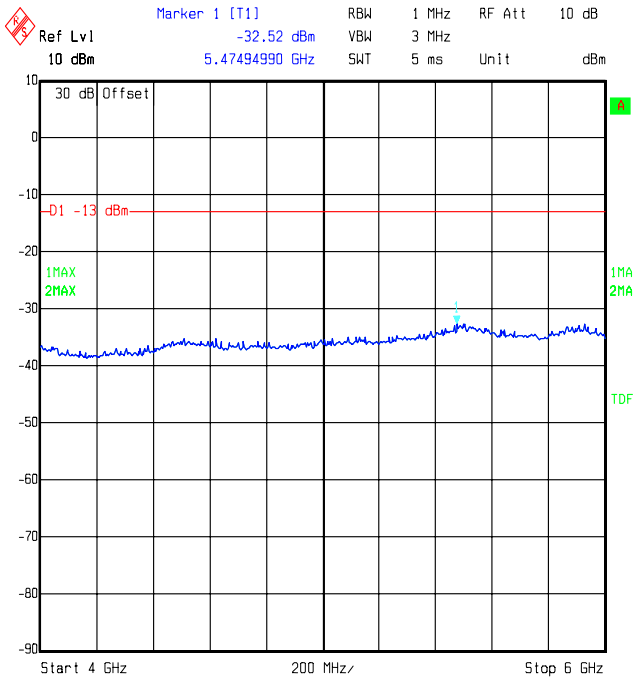
Title: 49249JD05
Comment A: FCC PART24 GSM1900 TX RADIATED EMISSIONS TOP CHANNEL
Date: 15.JUN.2007 10:58:11



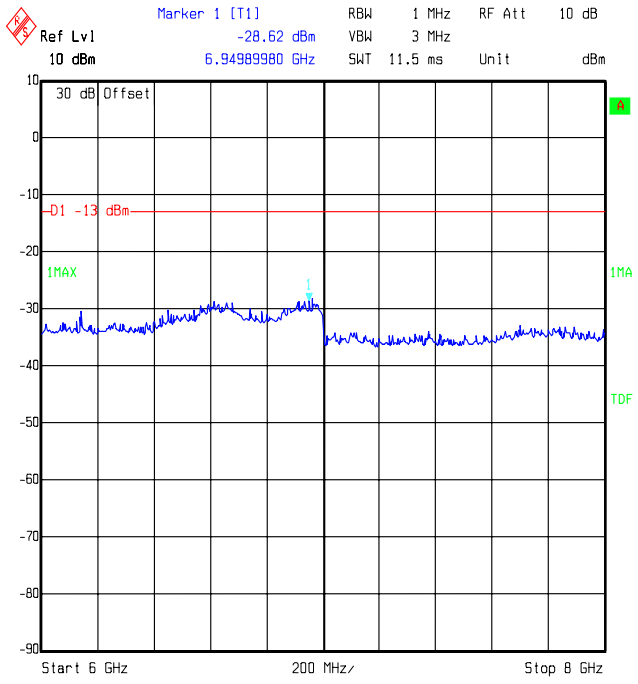
Title: 49249JD05
Comment A: FCC PART24 GSM1900 TX RADIATED EMISSIONS TOP CHANNEL
Date: 15.JUN.2007 11:59:16

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

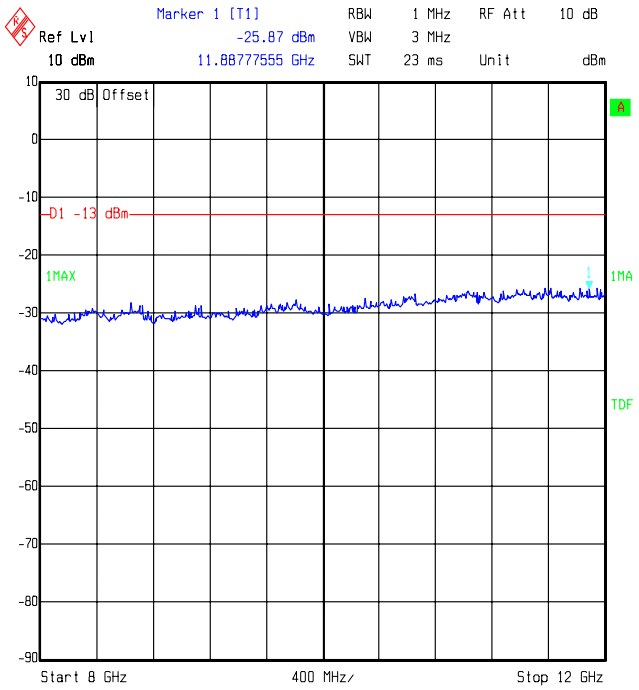
Transmitter Out of Band Radiated Emissions: Section 2.1053 & 24.238 (Continued)



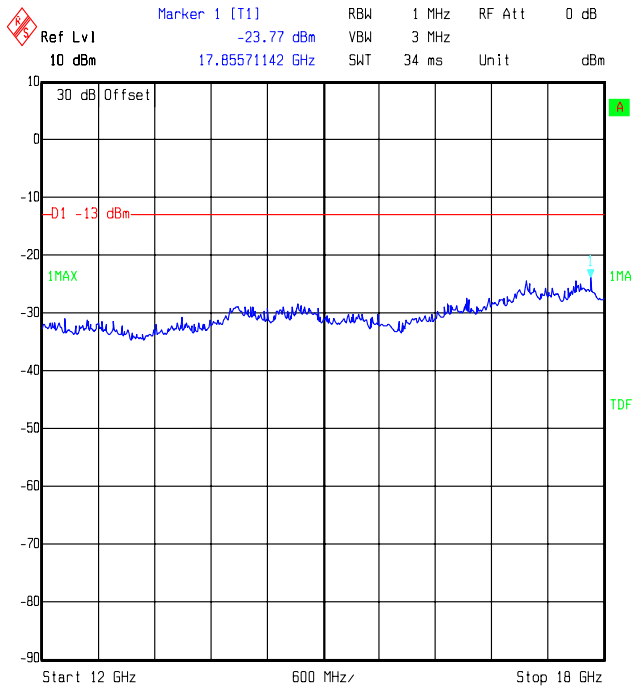
Date: 18.JUN.2007 13:59:19



Date: 18.JUN.2007 14:03:59



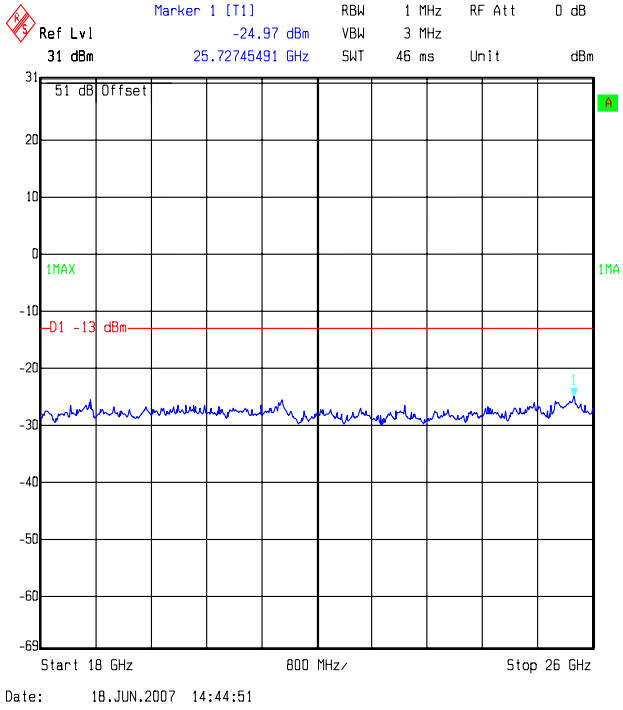
Date: 18.JUN.2007 14:06:33



Date: 18.JUN.2007 14:09:09

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

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



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

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	467.456	6	117.707
2	245.068	7	96.963
3	223.786	8	98.657
4	140.764	9	112.247
5	111.484	10	86.331

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

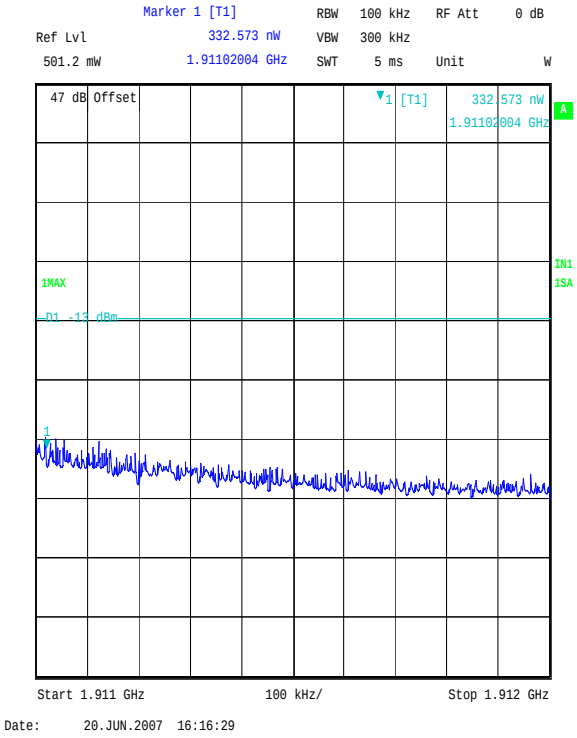
2nd 1 MHz block immediately outside adjacent frequency block

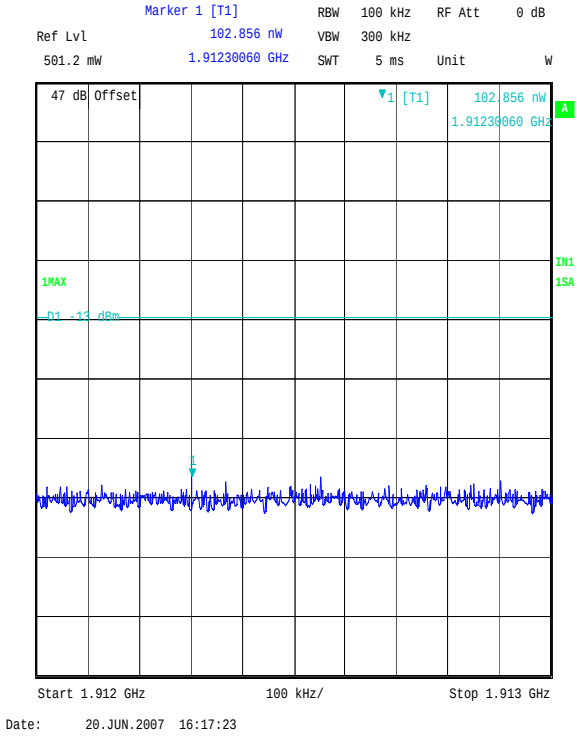
100 kHz Strip Number	Peak Power (nW/100 kHz)	100 kHz Strip Number	Peak Power (nW/100 kHz)
1	98.842	6	66.885
2	75.474	7	65.952
3	105.540	8	77.910
4	108.547	9	76.077
5	91.364	10	81.856

Results:

Band (MHz)	Peak Power (nW/MHz)	Peak Power (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Status
1911 to 1912	848.447	-30.7	-13.0	17.7	Complied
1912 to 1913	1700.463	-27.7	-13.0	14.7	Complied

Transmitter Out of Band Radiated Emissions: Section 2.1051 & 24.238 (Continued)





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

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

The EUT was configured for transmitter radiated emissions testing, as 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.

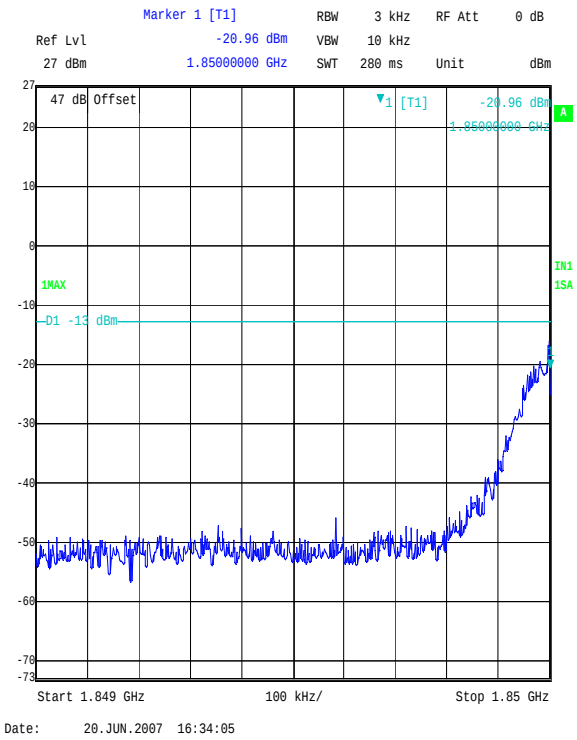
Results:

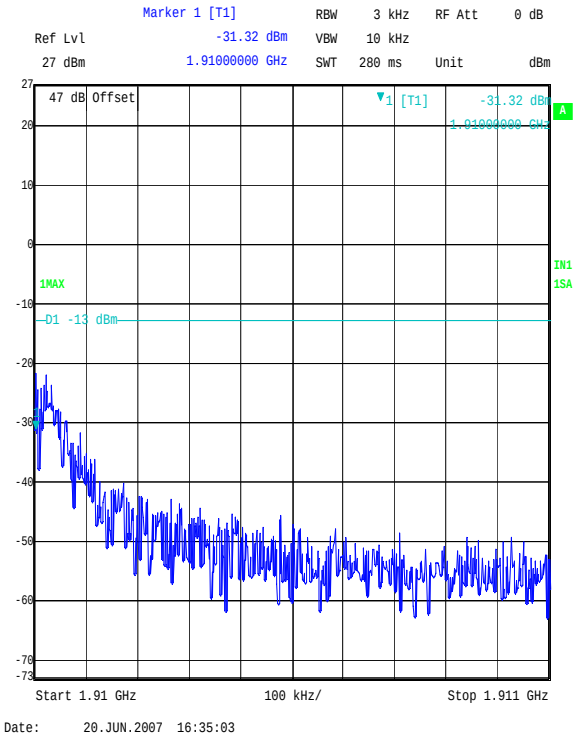
Bottom Band Edge

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-20.9	-13.0	7.9	Complied

Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-31.3	-13.0	18.3	Complied





8. Measurement Uncertainty

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

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

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

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

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	+/- 3.25 dB
Carrier Output Power	Not applicable	95%	+/- 0.46 dB
Conducted Emissions	9 kHz to 26 GHz	95%	+/- 1.2 dB
Conducted Emissions Antenna Port	30 MHz to 40 GHz	95%	+/- 1.2 dB
Effective Isotropic Radiated Power (EIRP)	Not applicable	95%	+/- 1.78 dB
Frequency Stability	Not applicable	95%	+/- 20 Hz
Minimum Bandwidth	Not applicable	95%	+/- 0.12 %
Occupied Bandwidth	1850 to 1910 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%	+/- 1.78 dB

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

9. Measurement Methods

9.1. Conducted Output Power

The EUT was connected to a spectrum analyser and to a GSM test set via suitable cables, RF attenuators and combiners.

The connection was made to the EUT either via an antenna port or by antenna terminals made available by the client.

The total loss of the cables, attenuators and combiner were measured and entered as a reference level offset into the measuring receiver to correct for the losses.

The EUT was set to the required channel and the transmitter set to operate at full power.

A marker was set to the maximum indicated peak and the conducted power was recorded.

This test was performed on the bottom, middle and top channels.

The test equipment settings for conducted antenna port measurements were as follows:

Receiver Function	Setting
Detector Type:	Peak
Mode:	Max Hold
Bandwidth:	1 MHz
Amplitude Range:	100 dB
Step Size:	Continuous sweep
Sweep Time:	Coupled

9.2. 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 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 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

9.3. Frequency Stability

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 a non-compliance. There is also a frequency graph presented offering the frequency variation around nominal frequency.

9.4. Occupied Bandwidth

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

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

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

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

9.5. Transmitter Conducted Emissions Measurements

The test was performed in a laboratory environment.

Spurious emission measurements at the antenna port were performed from the lowest declared frequency to 10 times the highest EUT fundamental frequency.

A measuring receiver was connected to the antenna port of the EUT via a suitable cable and RF Attenuator. The total loss of both the cable and the attenuator were measured and entered as a reference level offset into the measuring receiver to correct for the losses.

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.

The frequency band described above was investigated with the transmitter operating at full power on the top, bottom and middle channels. Any spurious observed were then recorded and 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.

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 to be 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.

The test equipment settings for conducted antenna port measurements were as follows:

Receiver Function	Settings
Detector Type:	Peak
Mode:	Max Hold
Bandwidth:	1 MHz >1 GHz
Bandwidth:	10 kHz <1 GHz
Amplitude Range:	100 dB
Step Size:	Continuous sweep
Sweep Time:	Coupled

The resolution bandwidth used for measurements in the 1 MHz blocks either side of the declared operating frequency block were set as described in the procedure above.

9.6. 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 115V 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

9.7. Transmitter Radiated Emissions

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.

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.

Transmitter Radiated Emissions (Continued)

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.

9.8. 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

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval
A028	Horn Antenna	Eaton	91888-2	304	08 Jun 2006	36
A031	Horn Antenna	Eaton	91889-2	557	08 Jun 2006	36
A1069	Single Phase LISN	Rohde & Schwarz	ESH3-Z5	837469/012	09 Feb 2007	12
A1392	Attenuator	Huber & Suhner	757456	6820.17.B	Cal before use	-
A1537	Directional Coupler	Hewlett Packard	778D	1144A05122	Cal before use	-
C1154	Cable	The Workhorse	WHU26-3636-060	None	05 Jun 2007	12
C1164	Cable	Rosenberger	FA210A1015007070	43188-1	04 Jun 2007	12
C1265	Cable	Rosenberger	FA210A1020007070	49317-01	Cal before use	-
C1268	Cable	Rosenberger	FA210A0075008080	49356-1	Cal before use	-
C363	Cable	Rosenberger	RG142	None	Cal before use	-
E013	Thermal chamber	Sanyo	ATMOS	None	Not calibrated	-
G085	Signal Generator	Hewlett Packard	83650L	3614A00104	03 Nov 2006	24
M1010	RF Power Sensor	Hewlett Packard	8485A	3318A12380	29 Jun 2006	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	08 Sep 2006	12
M1140	Radio Test Set	Anritsu	MT8820A	6K0000647	Not calibrated	-
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	25 Jan 2007	12
M1273	Test Receiver	Rhode & Schwarz	ESIB 26	100275	20 Feb 2007	12
M1435	Power Meter	Hewlett Packard	437B	3125U14631	30 Oct 2006	12
S209	Screened Room	RFI	9		Not calibrated	-
S212	Screened Room	RFI	12		Not calibrated	-

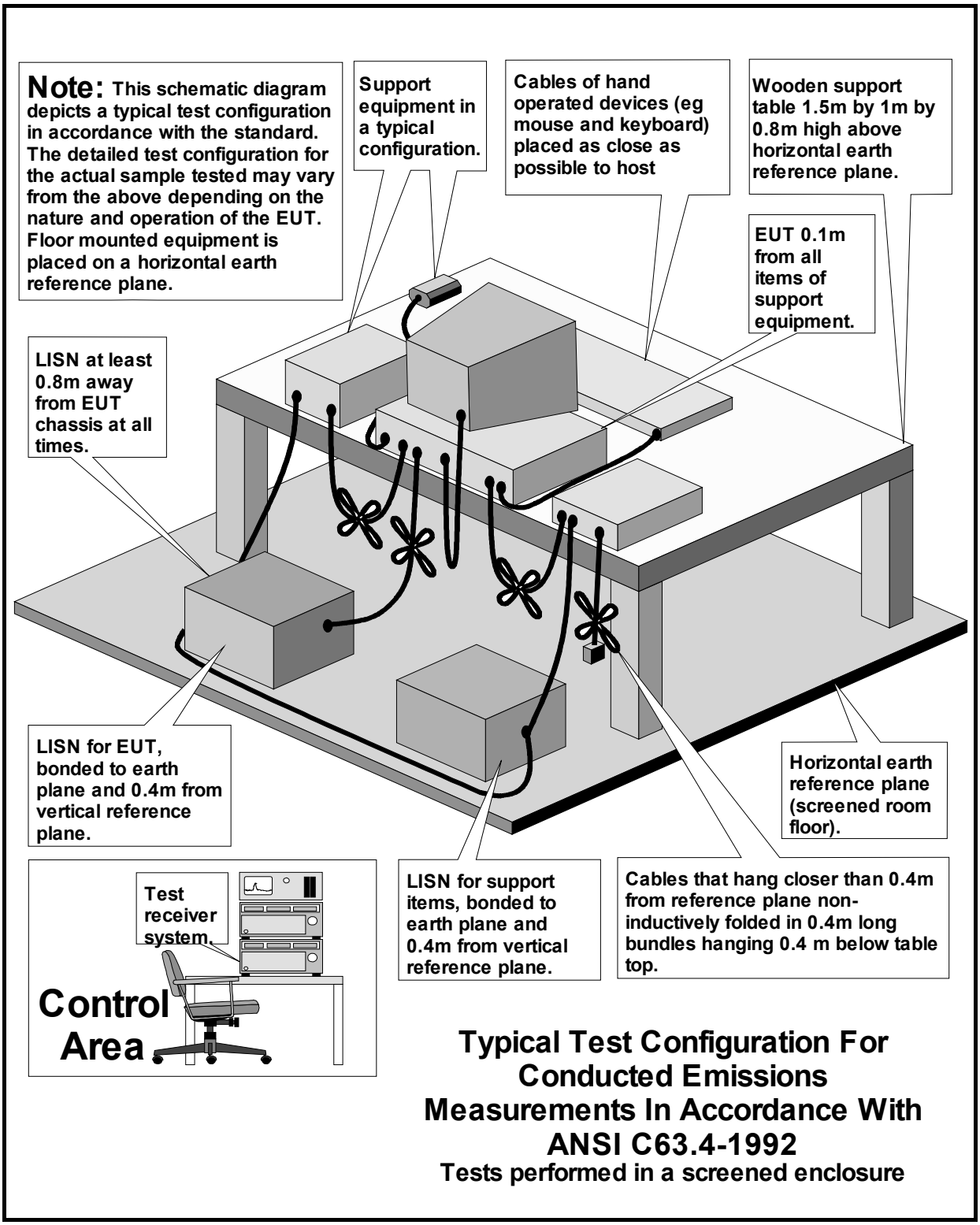
NB In accordance with UKAS requirements, all the measurement equipment is on a calibration schedule. All equipment were within calibration at the time of the test.

Appendix 2. Test Configuration Drawings

This appendix contains the following drawings:

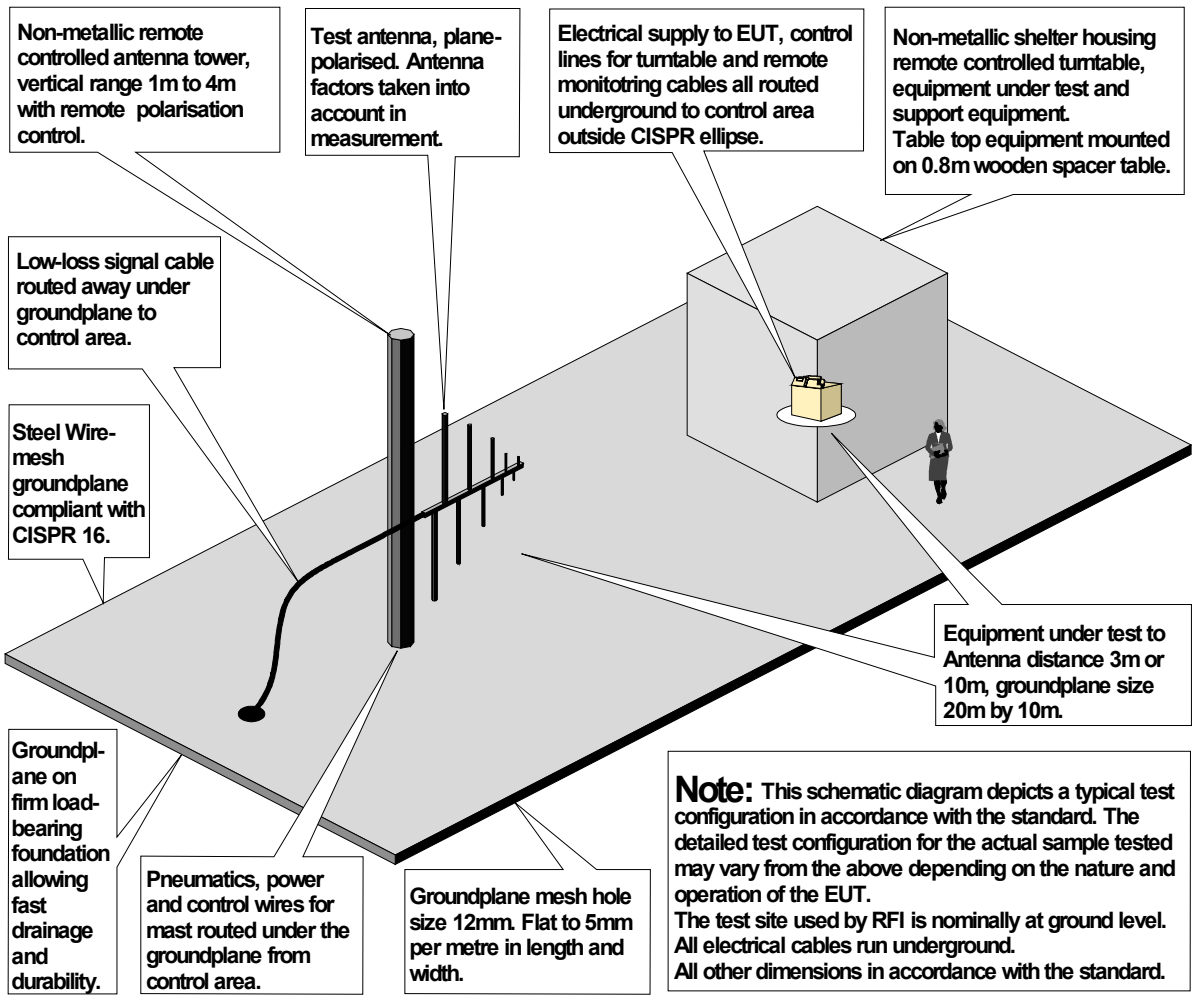
Drawing Reference Number	Title
DRG\49249JD03A\EMICON	Test configuration for measurement of conducted emissions.
DRG\49249JD03A\EMIRAD	Test configuration for measurement of radiated emissions.

DRG\49249JD03A\EMICON



Note: This diagram is also valid for the latest version of ANSI C63.4-2003

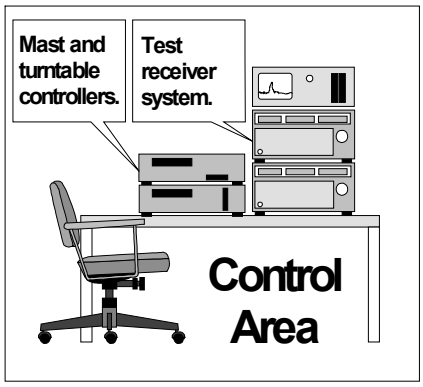
DRG\49249JD03A\EMIRAD



Note: This schematic diagram depicts a typical test configuration in accordance with the standard. The detailed test configuration for the actual sample tested may vary from the above depending on the nature and operation of the EUT.
The test site used by RFI is nominally at ground level.
All electrical cables run underground.
All other dimensions in accordance with the standard.

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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