TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Panasonic Mobile Comms Dev of Europe Ltd
P906i

To: FCC Part 15.247: 2007 (Subpart C)

Test Report Serial No:
RFI/RPTE2/RP73067JD04A

Supersedes Test Report Serial No:
RFI/RPTE1/RP73067JD04A

This Test Report Is Issued Under The Authority Of Steve Flooks, Service Leader RPG:  **pp Brian Watson**	
Checked By: Brian Watson 	**Report Copy No: PDF01**
Issue Date: 27 March 2008	**Test Dates: 12 February 2008 to 26 February 2008**

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1. Client Information

Company Name:	Panasonic Mobile Communications Development of Europe Ltd
Address:	2 Gables Way Colthrop Thatcham Berkshire RG19 4ZB
Contact Name:	Mr M Hargreaves

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 dual mode (W-CDMA/GSM) Cellular Mobile Telephone with Bluetooth.

2.2. Identification of Equipment Under Test (EUT)

Description:	Mobile Headset
Brand Name:	DoCoMo
Model Name or Number:	P906i
Serial Number:	None stated
IMEI Number:	357015010018932
Hardware Version Number:	Rev C
Software Version Number:	B-WN905S.01.03.001 P7isCv05.01.02.00
FCC ID Number:	UCE208006A
Country of Manufacture:	Japan
Date of Receipt:	12 February 2008

Description:	Battery
Brand Name:	DoCoMo
Model Name or Number:	P16
Serial Number:	Not applicable
IMEI Number:	Not applicable
Hardware Version Number:	Not applicable
Software Version Number:	Not applicable
FCC ID Number:	Not applicable
Country of Manufacture:	Japan
Date of Receipt:	12 February 2008

2.3. Modifications Incorporated in the EUT

During the course of testing the EUT was not modified.

2.4. Accessories

The following accessories were supplied with the EUT during testing:

Description:	AC Charger
Brand Name:	DoCoMo
Model Name or Number:	FOMA AC Charger 01 for Global use MAS-BH0008-A 002
Serial Number:	Not applicable
Cable Length and Type:	1.5m round twin core
Connected to Port:	Charge / Data Port

Description:	DC Charger
Brand Name:	DoCoMo
Model Name or Number:	FOMA DC Adapter 02
Serial Number:	Not applicable
Cable Length and Type:	2.0m approx / 2 core curl-cord
Connected to Port:	Charge / Data Port

Description:	Personal Hands Free (stereo)
Brand Name:	DoCoMo
Model Name or Number:	Flat-plug Stereo Earphone Set P01
Serial Number:	Not applicable
Cable Length and Type:	1.8m / Multi-core
Connected to Port:	AV Output

Description:	Micro-SD Memory Card
Brand Name:	-
Model Name or Number:	Not applicable
Serial Number:	Not applicable
Cable Length and Type:	Not applicable
Connected to Port:	Dedicated micro-SD card port

Accessories - Continued

Description:	Charge / Data Cable
Brand Name:	None Stated
Model Name or Number:	FOMA USB Cable with Charge Function 01
Serial Number:	Not applicable
Cable Length and Type:	0.5m / Multi-core
Connected to Port:	Charge / Data Port

2.5. Additional Information Related to Testing

Intended Operating Environment:	Within GSM Coverage UMTS Coverage Area		
Equipment Category:	Bluetooth GSM/GPRS Short Range Device UMTS FDD I		
Type of Unit:	Portable (Standalone battery powered device) Transceiver		
Power Supply Requirement:	Internal Battery Supply of 3.7V (nominal)		
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
1	Charge/Data	USB/Multipin
2	AV Out	Data /Multipin
3	USIM	Multipin
4	Micro-SD	Multipin

3. Test Specification, Methods and Procedures

3.1. Test Specification

Reference:	FCC Part 15.247: 2007 Subpart C
Title:	Code of Federal Regulations, Part 15.247 (47CFR15) (Intentional Radiators operating within the band 2400 MHz to 2483.5 MHz)

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:

- Bluetooth Transmit mode: the EUT transmitted at maximum power for the duration of the test. Test mode was achieved by a bespoke application on a Sony VAIO-PCG-55 in Laptop via the USB Port.
- Bluetooth Idle mode
- Radiated Emissions scans were preformed in EDR mode as this was found to be the worst case.

5.2. Configuration and Peripherals

The EUT was tested in the following configuration:

- Tested with the 110V AC charger and personal handsfree attached as this was found to be the “worst case”.

6. Summary of Test Results

Range of Measurements	Specification Reference	Port Type	Compliancy Status
Idle Mode AC Conducted Emissions (150 kHz to 30 MHz)	C.F.R. 47 FCC Part 15: 2007 Section 15.107	AC Mains	Complied
Idle Mode Radiated Spurious Emissions	C.F.R. 47 FCC Part 15: 2007 Section 15.109	Antenna	Complied
Transmitter AC Conducted Emissions (150 kHz to 30 MHz)	C.F.R. 47 FCC Part 15: 2007 Section 15.207	AC Mains	Complied
Transmitter 20 dB Bandwidth	C.F.R. 47 FCC Part 15: 2007 Section 15.247(a)(1)	Antenna	Complied
Transmitter Carrier Frequency Separation	C.F.R. 47 FCC Part 15: 2007 Section 15.247(a)(1)	Antenna	Complied
Transmitter Average Time of Occupancy	C.F.R. 47 FCC Part 15: 2007 Section 15.247(a)(1)(iii)	Antenna	Complied
Transmitter Maximum Peak Output Power	C.F.R. 47 FCC Part 15: 2007 Section 15.247(b)(1)	Antenna	Complied
Transmitter Radiated Emissions	C.F.R. 47 FCC Part 15: 2007 Sections 15.247(d) & 15.209(a)	Antenna	Complied
Transmitter Band Edge Radiated Emissions	C.F.R. 47 FCC Part 15: 2007 Sections 15.247(d) & 15.209(a)	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

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

Tests were performed using the test methods detailed in ANSI C63.4 Section 7.

Quasi-Peak Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Note(s)
0.150000	Neutral	26.5	66.0	39.5	Complied
0.186000	Neutral	30.8	64.2	33.4	Complied
0.194000	Neutral	31.4	63.9	32.5	Complied
0.202000	Neutral	29.4	63.5	34.1	Complied
0.246000	Live	17.0	61.9	44.9	Complied
0.262000	Neutral	17.7	61.4	43.7	Complied
1.210000	Neutral	18.3	56.0	37.7	Complied
1.390000	Live	21.0	56.0	35.0	Complied
1.438000	Live	20.9	56.0	35.1	Complied
1.666000	Live	19.1	56.0	36.9	Complied

Average Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Note(s)
0.266000	Neutral	10.2	51.2	41.0	Complied
0.406000	Neutral	6.2	47.7	41.5	Complied
0.686000	Neutral	3.7	46.0	42.3	Complied
0.818000	Neutral	3.7	46.0	42.3	Complied
0.942000	Neutral	4.7	46.0	41.3	Complied
1.202000	Live	4.7	46.0	41.3	Complied
1.402000	Live	4.7	46.0	41.3	Complied
1.462000	Live	4.8	46.0	41.2	Complied
1.654000	Live	6.4	46.0	39.6	Complied
3.698000	Live	4.9	46.0	41.1	Complied

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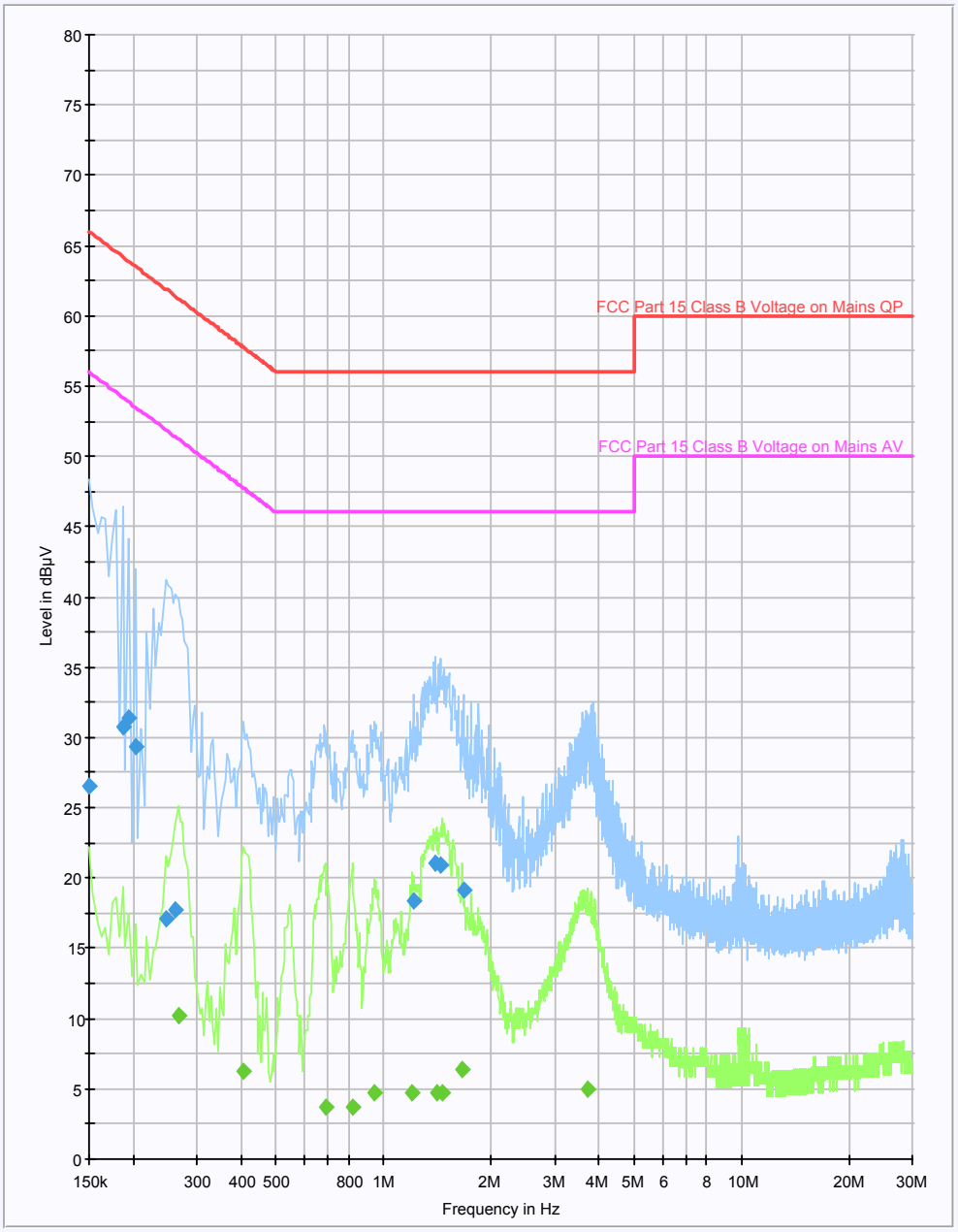
Idle Mode AC Conducted Spurious Emissions: Section 15.107 (Continued)



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

7.2.2. Idle Mode Radiated Spurious Emissions: Section 15.109

Tests were performed using the test methods detailed in ANSI C63.4 Section 8, and Public Notice DA 00-705 (March 30, 2000).

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

Frequency (MHz)	Antenna Polarity	Q-P Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
45.6312	Vertical	11.8	40.0	28.2	Complied

Note(s):

1. *In the frequency range 30MHz to 1GHz all final emissions measurements were greater than 25dB below the limit and were close to the ambient level, therefore only the maximum level was recorded in the table above.*

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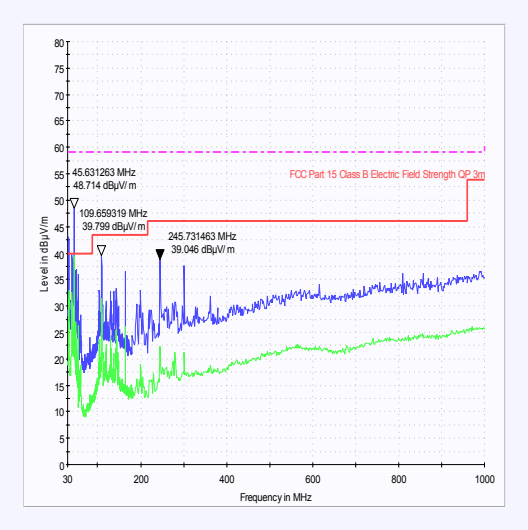
Idle Mode Radiated Spurious Emissions: Section 15.109 (Continued)



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

Idle Mode Radiated Spurious Emissions: Section 15.109 (Continued)

Electric Field Strength Measurements (Frequency Range: 1 GHz to 13.0 GHz)

Highest Peak Level:

Frequency (GHz)	Antenna Polarity	Detector level (dBμV)	Transducer factor (dB)	Actual Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
3.1784	Vertical	56.6	-8.0	48.6	54.0	5.4	Complied
5.1503	Vertical	41.5	-2.8	38.7	54.0	15.3	Complied
7.8156	Vertical	42.8	-0.6	42.2	54.0	11.8	Complied
10.6854	Vertical	42.6	3.8	46.4	54.0	7.6	Complied

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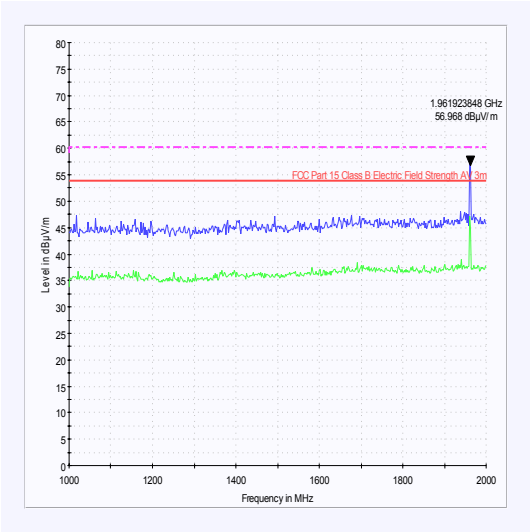
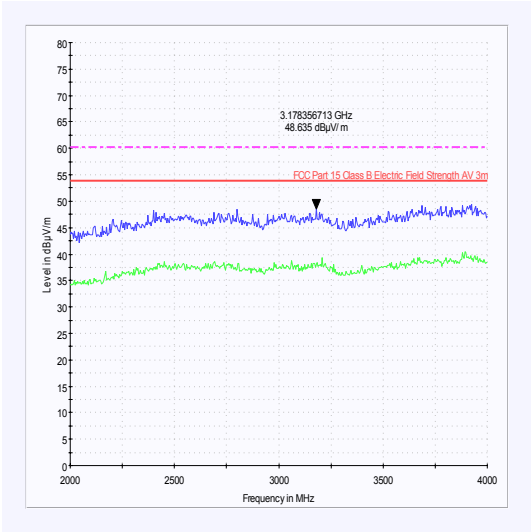
Idle Mode Radiated Spurious Emissions: Section 15.109 (Continued)

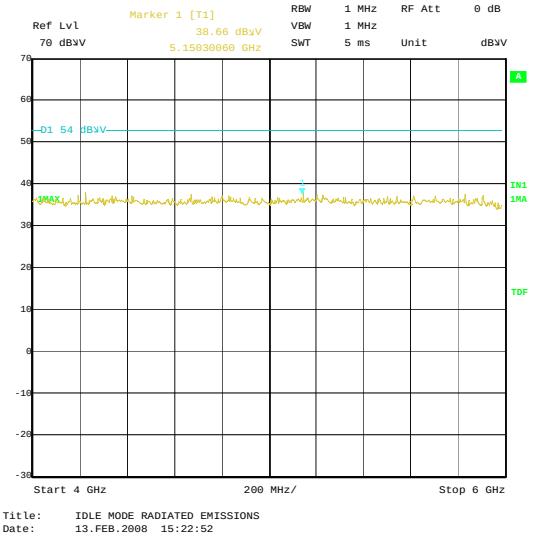


Idle Mode: 1GHz to 2GHz

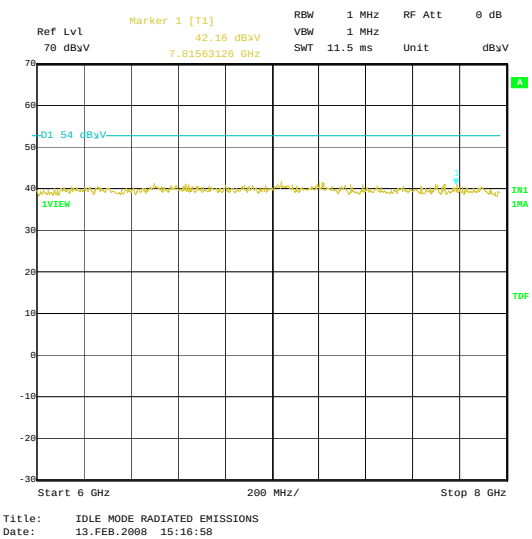
Note: the emission at 1.9619 GHz is the down link signal from the support GSM equipment.



Idle Mode: 2GHz to 4GHz



Idle Mode: 4GHz to 6GHz



Idle Mode: 6GHz to 8GHz

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

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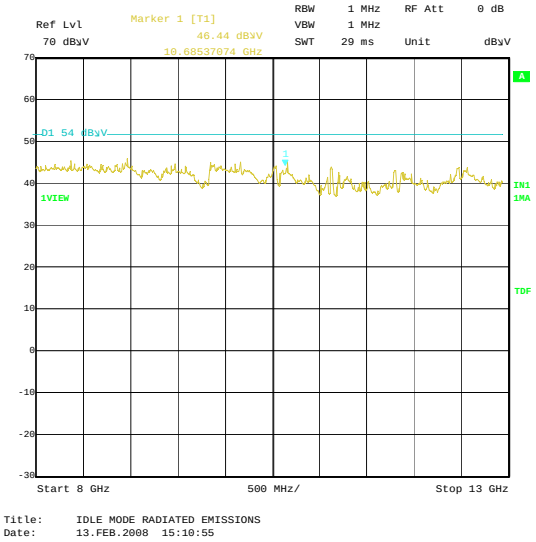
Idle Mode Radiated Spurious Emissions: Section 15.109 (Continued)



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

7.2.3. Transmitter AC Conducted Spurious Emissions: Section 15.207

Tests were performed using the test methods detailed in ANSI C63.4 Section 7.

Quasi-Peak Detector Measurements on Live and Neutral Lines

Top Channel

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Note(s)
0.158000	Live	31.1	65.6	34.5	Complied
0.182000	Live	24.4	64.4	40.0	Complied
0.198000	Live	31.5	63.7	32.2	Complied
0.238000	Neutral	20.1	62.2	42.1	Complied
1.214000	Neutral	19.5	56.0	36.5	Complied
1.374000	Live	21.5	56.0	34.5	Complied
1.522000	Live	23.5	56.0	32.5	Complied
1.682000	Live	21.3	56.0	34.7	Complied
1.918000	Live	14.6	56.0	41.4	Complied
3.642000	Neutral	18.3	56.0	37.7	Complied

Average Detector Measurements on Live and Neutral Lines

Top Channel

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Note(s)
0.190000	Live	14.8	54.0	39.2	Complied
0.206000	Live	14.3	53.4	39.1	Complied
0.494000	Live	3.7	46.1	42.4	Complied
0.510000	Live	3.7	46.0	42.3	Complied
0.930000	Live	2.7	46.0	43.3	Complied
1.086000	Live	2.8	46.0	43.2	Complied
1.242000	Live	4.7	46.0	41.3	Complied
1.422000	Live	6.3	46.0	39.7	Complied
1.506000	Live	5.6	46.0	40.4	Complied
1.646000	Live	6.4	46.0	39.6	Complied

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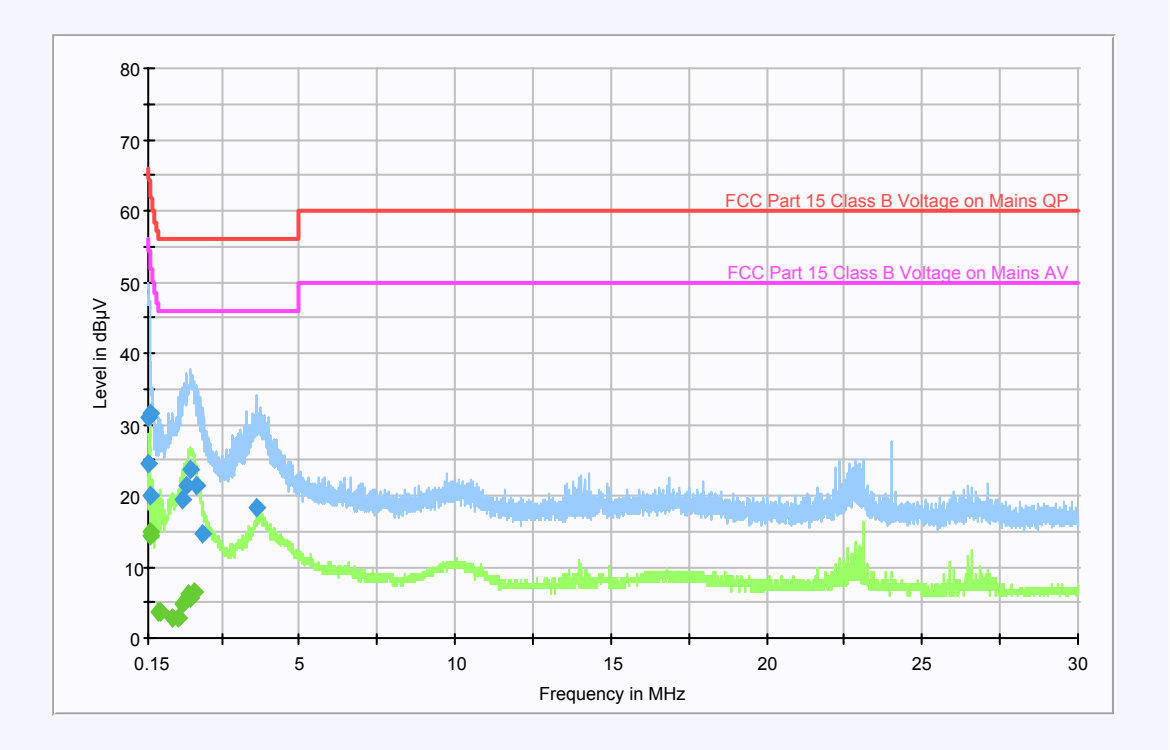
Transmitter AC Conducted Spurious Emissions: Section 15.207 (Continued)

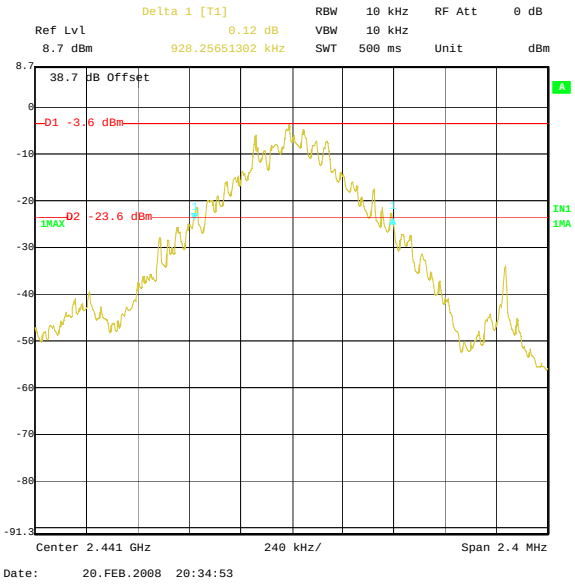


Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.

7.2.4. Transmitter 20 dB Bandwidth: Section 15.247(a)(1)

Tests were performed using the test methods detailed in Public Notice DA 00-705 (March 30, 2000).

Transmitter 20 dB Bandwidth (kHz)	Limit (kHz)
928.2565	None specified



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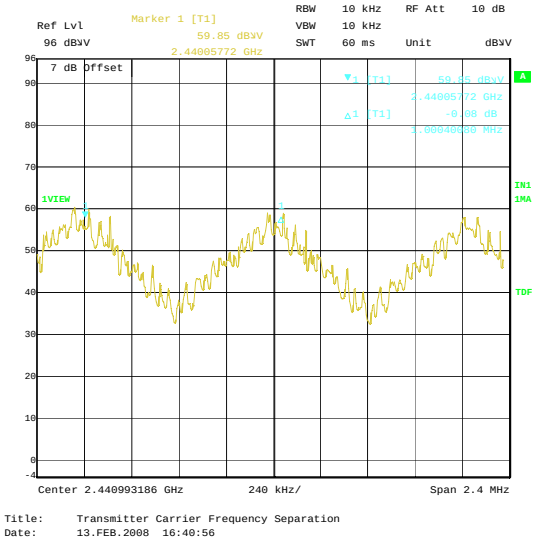
7.2.5. Transmitter Carrier Frequency Separation: Section 15.247(a)(1)

Tests were performed using the test methods detailed in Public Notice DA 00-705 (March 30, 2000).

Transmitter Carrier Frequency Separation (kHz)	Limit (> 20 dB BW) (kHz)	Margin (kHz)	Result
1000.400	618.837	381.563	Complied



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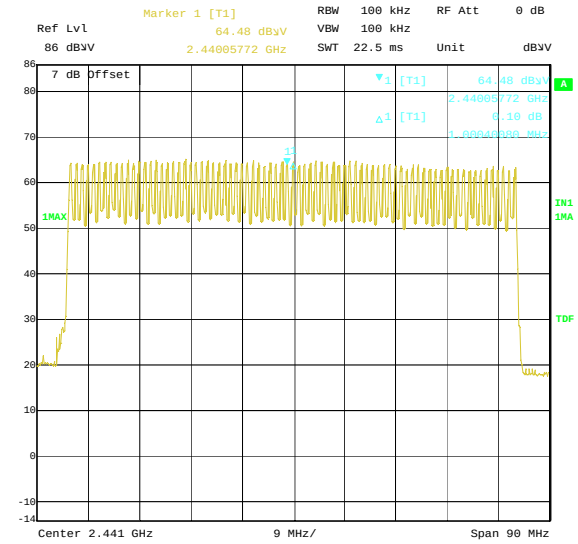
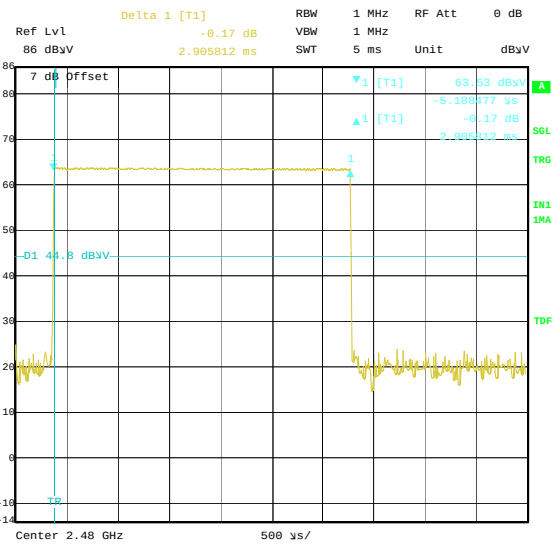
7.2.6. Transmitter Average Time of Occupancy: Section 15.247(a)(1)(iii)

Tests were performed using the test methods detailed in Public Notice DA 00-705 (March 30, 2000).

Emission Width (µs)	Number of Hops in 31.6 Seconds	Average Time of Occupancy (s)	Limit (s)	Margin (s)	Result
2905.812	70	0.195	0.4	0.205	Complied



Title: Transmitter Carrier Frequency Separation
Date: 13.FEB.2008 17:03:48



Title: Average Time of Occupancy, Pulse Length
Date: 13.FEB.2008 17:41:30

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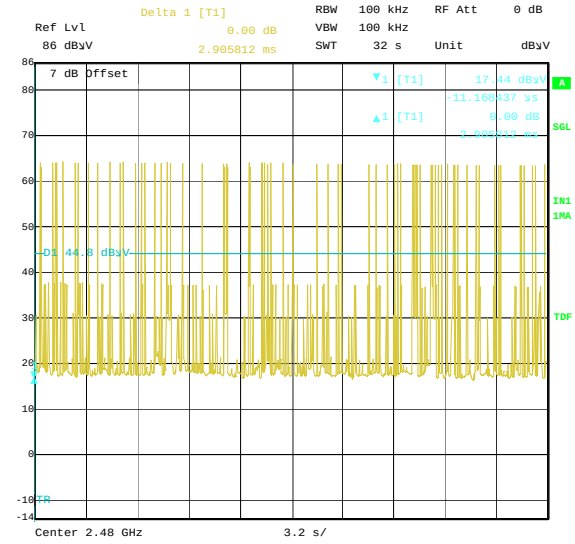
Transmitter Average Time of Occupancy: Section 15.247(a)(1)(iii) (Continued)



Title: Average Time of Occupancy, Number of Hops
Date: 13.FEB.2008 17:32:06

7.2.7. Transmitter Maximum Peak Output Power: Section 15.247(b)(1)

Tests were performed using the test methods detailed in Public Notice DA 00-705 (March 30, 2000), ANSI TIA-603-C-2004 and FCC CFR part 2.

Results:

Channel	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	-1.0	30.0	31.0	Complied
Middle	-0.5	30.0	30.5	Complied
Top	-0.9	30.0	30.7	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: Section 15.247(d) and 15.209(a)

Tests were performed using the test methods detailed in ANSI C63.4 Section 8, and Public Notice DA 00-705 (March 30, 2000).

Electric Field Strength Measurements: 30 to 1000 MHz (emissions occurring in the restricted bands)

Top Channel

Frequency (MHz)	Antenna Polarity	Q-P Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
109.6593	Vertical	19.0	43.5	23.5	Complied
137.3146	Vertical	24.0	43.5	18.5	Complied

Note(s):

1. *These tests were performed in the top channel as the level for both bottom and middle channel were the same as the top channel.*

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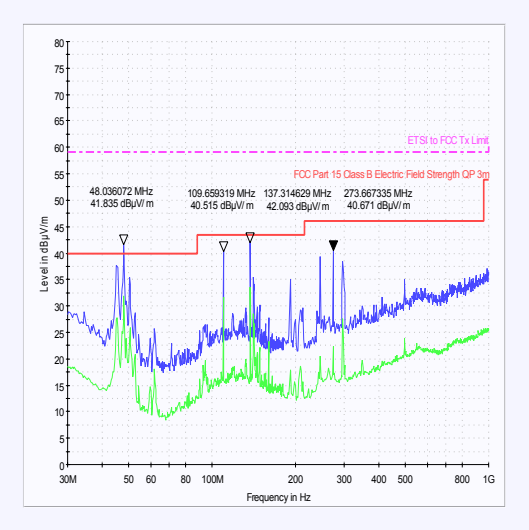
Transmitter Radiated Emissions: Section 15.247(d) and 15.209(a) (Continued)



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

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Transmitter Radiated Emissions: Section 15.247(d) and 15.209(a) (Continued)

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

Highest Peak Level: Top Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
10.684	Vertical	44.29	3.8	48.09	74.0	25.91	Complied

Highest Average Level: Top Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
10.684	Vertical	34.1	3.8	37.9	54.0	16.1	Complied

Highest Peak Level: Hopping Mode

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
10.684	Vertical	45.9	3.8	49.7	74.0	24.3	Complied

Highest Average Level: Hopping Mode

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
10.684	Vertical	34.8	3.8	38.6	54.0	15.4	Complied

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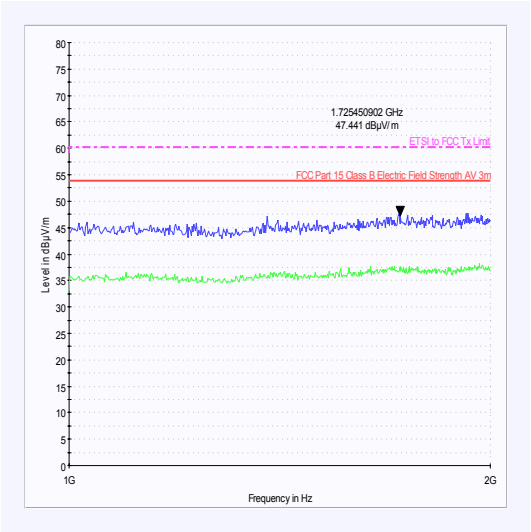
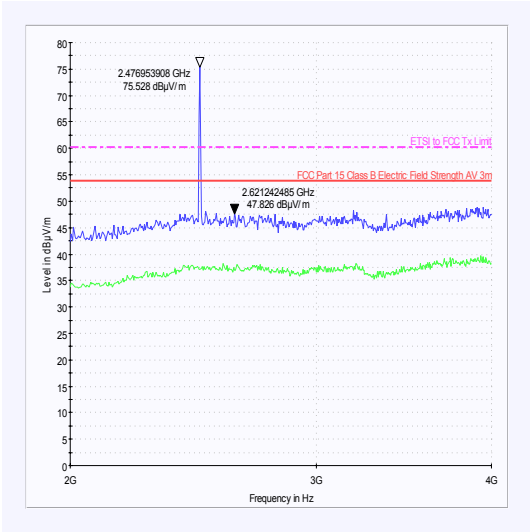
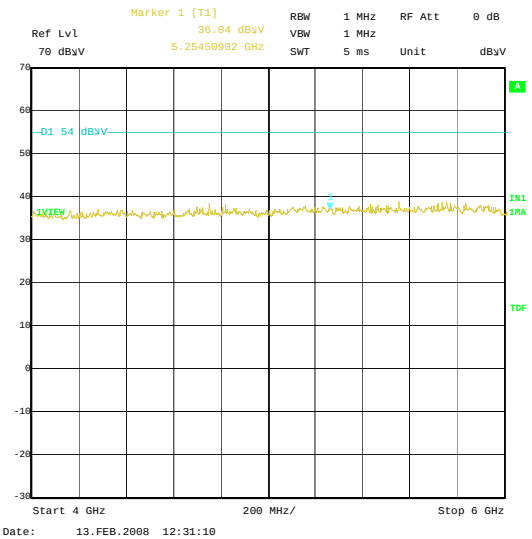
Transmitter Radiated Emissions: Section 15.247(d) and 15.209(a) (Continued)



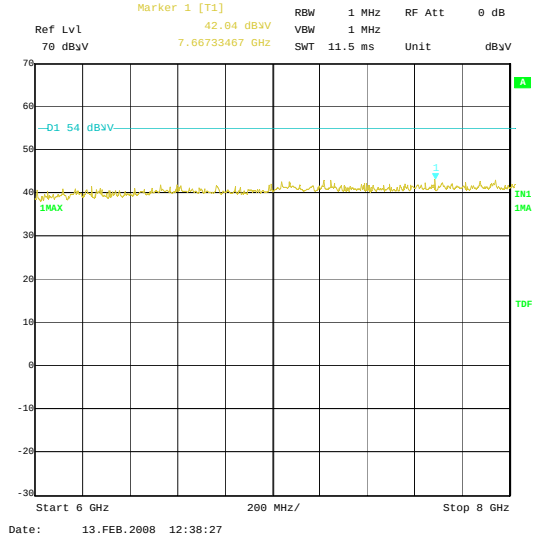
Tx Mode: 1GHz to 2GHz



Tx Mode: 2GHz to 4GHz



Tx Mode: 4GHz to 6GHz



Tx Mode: 6GHz to 8GHz

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

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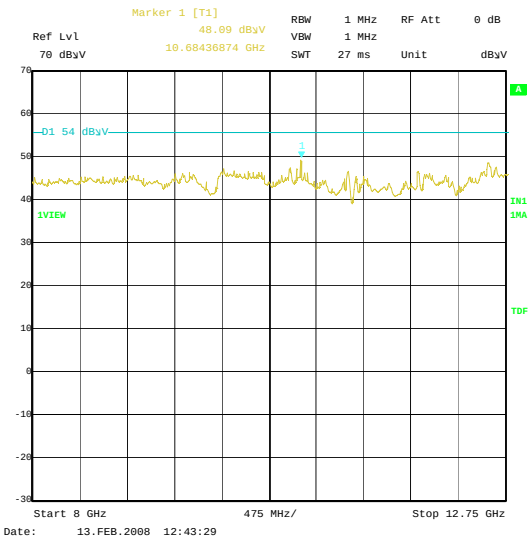
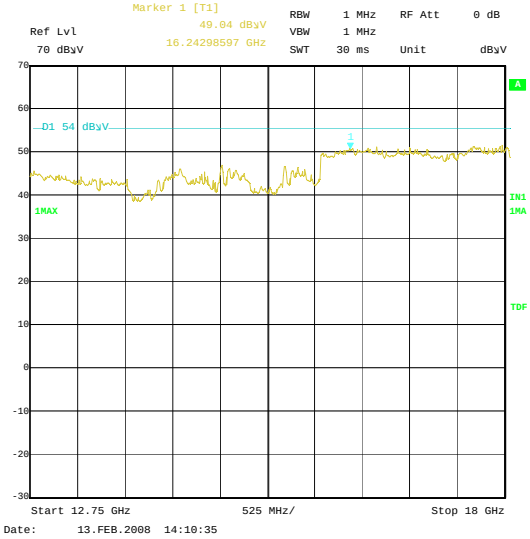
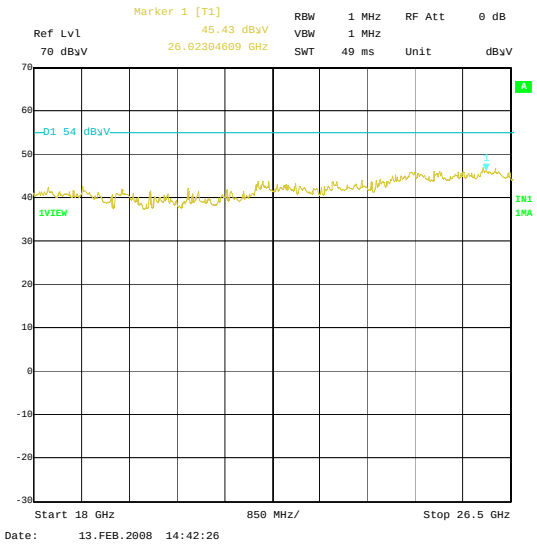
Transmitter Radiated Emissions: Section 15.247(d) and 15.209(a) (Continued)



Tx Mode: 8GHz to 12.75GHz



Tx Mode: 12.75GHz to 18GHz



Tx Mode: 18GHz to 26.5GHz

Note(s):

1. *Test was conducted in EDR Mode*
2. *These tests were performed in the top channel as the level for both bottom and middle channel were the same as the top channel.*

7.2.9. Transmitter Band Edge Radiated Emissions: Section 15.247(d) & 15.209(a)

Tests were performed using the test methods detailed in ANSI C63.4 Section 8, and Public Notice DA 00-705 (March 30, 2000).

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	Vertical	33.0	25.1	58.1	*74.2	15.9	Complied
2.4835	Vertical	30.1	25.1	55.2	74.0	18.8	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	Vertical	14.7	25.1	39.8	54.0	14.2	Complied

Note(s):

1. ** -20 dBc limit.*

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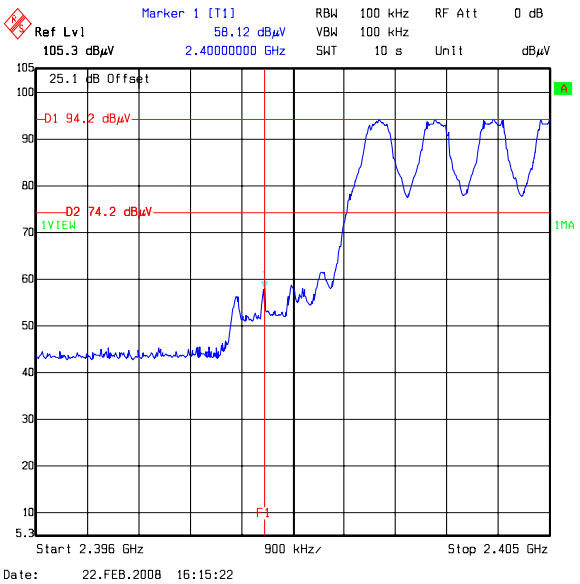
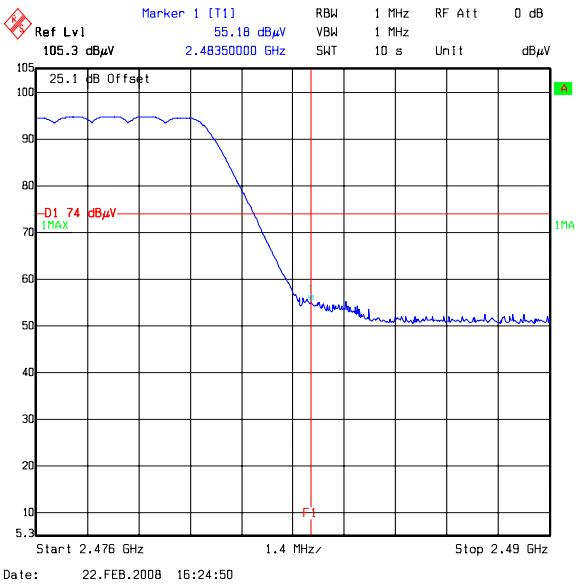
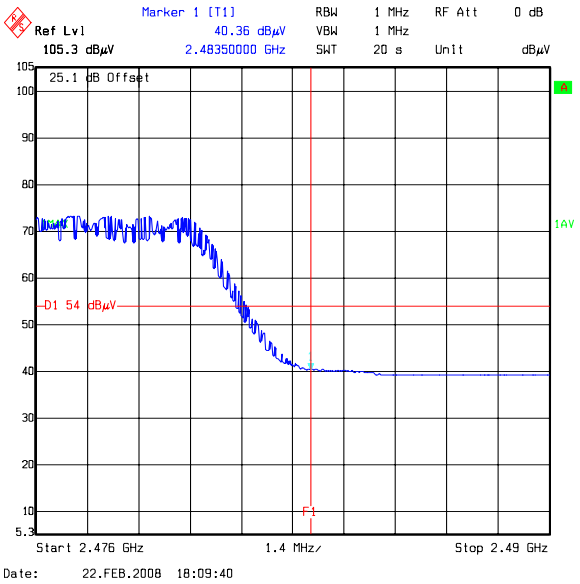
Transmitter Band Edge Radiated Emissions: Section 15.247(d) & 15.209(a) (Continued)







Transmitter Band Edge Radiated Emissions: Section 15.247(d) & 15.209(a) (Continued)

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	Vertical	32.3	25.1	57.4	*74.2	16.6	Complied
2.4835	Vertical	31.0	25.1	56.1	74.0	17.9	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	Vertical	19.1	25.1	44.2	54.0	9.8	Complied

Note(s):

1. ** -20 dBc limit.*

Test of: Panasonic Mobile Comms Dev of Europe Ltd
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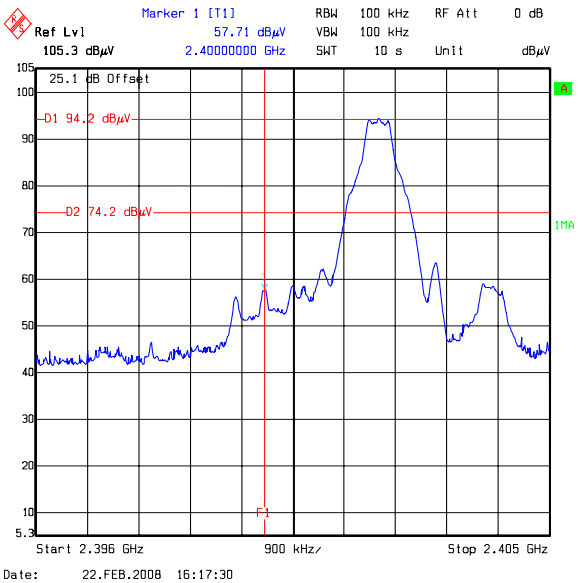
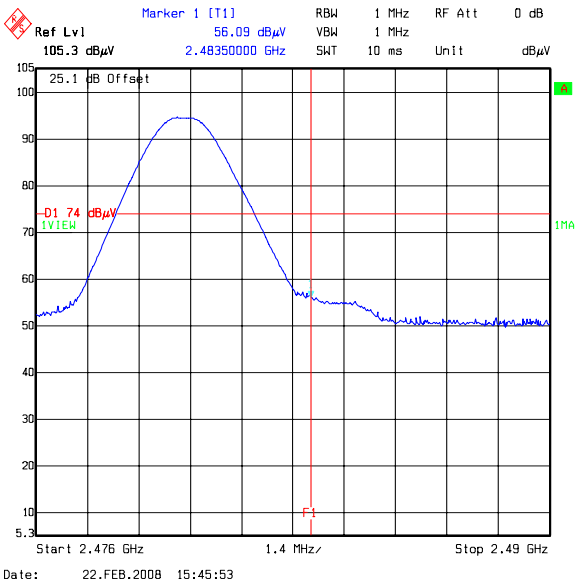
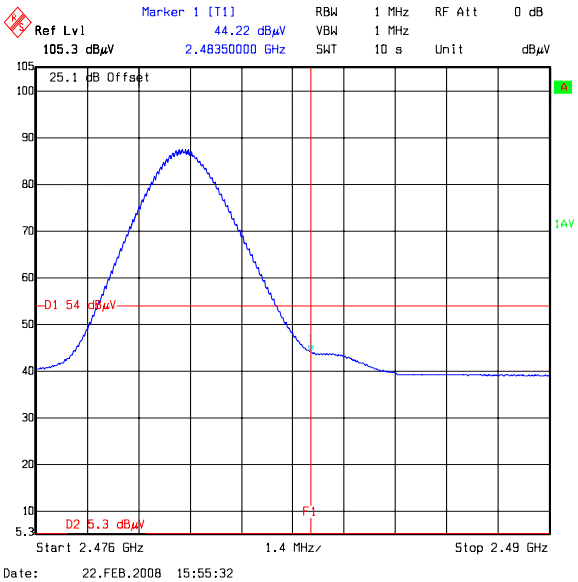
Transmitter Band Edge Radiated Emissions: Section 15.247(d) & 15.209(a) (Continued)



Bottom Channel



Top Channel Pk



Top Channel Ave

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
Transmitter Maximum Peak Output Power	Not applicable	95%	+/- 2.94 dB
Conducted Emissions Antenna Port	30 MHz to 40 GHz	95%	+/- 2.62 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. AC Mains Conducted Emissions

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

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

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

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

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

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

9.2. 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

9.3. Conducted Antenna Port Emissions

Conducted antenna port emissions measurements were performed using a 100 kHz bandwidth in accordance with the standard against the appropriate limits.

Prior to testing being performed a suitable RF attenuator and cable, were calibrated for the required frequency range. For each measurement range the calibrated level of the attenuator and cable were entered as an offset into the spectrum analyser to compensate for the losses in the measurement set up.

Initial measurements covering the entire measurement band in the form of swept scans were performed in order to identify frequencies on which the EUT was generating interference. This determined the frequencies on which final measurements were necessary. To make the final measurements a peak detector was used in conjunction with the appropriate detector IF measuring bandwidth.

Repetitive scans were performed to allow for emissions with low repetition rates.

Scans were performed to the upper frequency limits as stated in 15.33(a)(1).

9.4. 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.

9.5. 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.

9.6. Peak Output Power

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

Prior to testing being performed a suitable RF attenuator and cable were calibrated for the required frequencies. For each frequency to be measured, the calibrated level of the attenuator and cable were entered as an offset into a spectrum analyser to compensate for the measurement set up.

To determine the transmitter output power, the EUT was operated at maximum power and a result was obtained from the spectrum analyser using peak detector and trace Max Hold.

9.7. 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

9.8. 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)
A004	Line Impedance Stabilization Network	Rohde & Schwarz	ESH3-Z5	890 604/027	23 Apr 2007	12
A028	Antenna	Eaton	91888-2	304	08 Jun 2006	36
A031	Antenna	Eaton	91889-2	557	08 Jun 2006	36
A1037	Antenna	Chase EMC Ltd	CBL6112B	2413	13 Feb 2008	12
A1534	Pre Amplifier	Hewlett Packard	8449B OPT H02	3008A00405	Calibrated before use	-
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	16 Jan 2008	12
A253	Antenna	Flann Microwave	12240-20	128	17 Nov 2006	36
A254	Antenna	Flann Microwave	14240-20	139	17 Nov 2006	36
A255	Antenna	Flann Microwave	16240-20	519	17 Nov 2006	36
A256	Antenna	Flann Microwave	18240-20	400	17 Nov 2006	36
A259	Antenna	Chase	CBL6111	1513	13 Mar 2007	12
A436	Antenna	Flann	20240-20	330	24 Apr 2006	36
A512	Antenna	EMCO	3115	3993	17 Sep 2004	36
C1025	Cable	Rosenberger	FA210A-1-020m	FA00B 7564	Calibrated before use	-
C1065	Cable	Rosenberger	UFA210-1-7872	0985	Calibrated before use	-
C1072	Cable	Rosenberger	FA210a1030 M5050	Not Stated	Calibrated before use	-
C1164	Cable	Rosenberger Micro-Coax	FA210A1015 007070	43188-1	Calibrated before use	-
C1167	Cable	Rosenberger Micro-Coax	FA210A1030 007070	43190-01	Calibrated before use	-
C1268	Cable	Rosenberger	FA210A0075 008080	49356-1	Calibrated before use	-
C151	Cable	Rosenberger	UFA210A-1-1181-70x70	None	Calibrated before use	-
C160	Cable	Rosenberger	UFA210A-1-1181-70x70	None	Calibrated before use	-

Test Equipment Used – Continued

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
C172	Cable	Rosenberger	UFA210A-1-1181-70x70	None	Calibrated before use	-
C341	Cable	Andrews	None	None	Calibrated before use	-
C348	Cable	Rosenberger	UFA210A-1-1181-70x70	2993	Calibrated before use	-
C363	Cable	Rosenberger	RG142	None	Calibrated before use	-
C468	Cable	Rosenberger	UFA210A-1-3937-504504	98L0440	Calibrated before use	-
E0511	VTM 7004	Votsch Industrietechnik	VTM 7004	58566087700010	Calibrated before use	-
G088	Power Supply Unit	Thurlby Thandar	CPX200	100700	Calibrated before use	-
M023	Test Receiver	Rohde & Schwarz	ESVP	872 991/027	24 Apr 2007	12
M024	Spectrum Monitor	Rohde & Schwarz	EZM	873 952/006	Calibrated before use	-
M1093	Communications Test Set	Will tek	4202S	0513018	29 August 2003 (Communication purpose only)	-
M1242	Spectrum Analyser	Rohde & Schwarz, Inc.	FSEM30	845986/022	29 Nov 2007	12
M1229	Digital Multimeter	Fluke	179	87640015	20 Apr 2007	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	06 Feb 2008	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	15 Aug 2007	12
M1379	Test Receiver	Rohde and Schwarz	ESIB7	100330	02 Aug 2007	12
S201	Open Area Test Site	RFI	1		25 May 2007	12
S202	Site 2	RFI	2	S202-15011990	28 Jan 2008	12
S503	Antenna Mast	EMCO	1051-25	9205 1670	Calibration not required	-

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

Appendix 2. Test Configuration Drawings

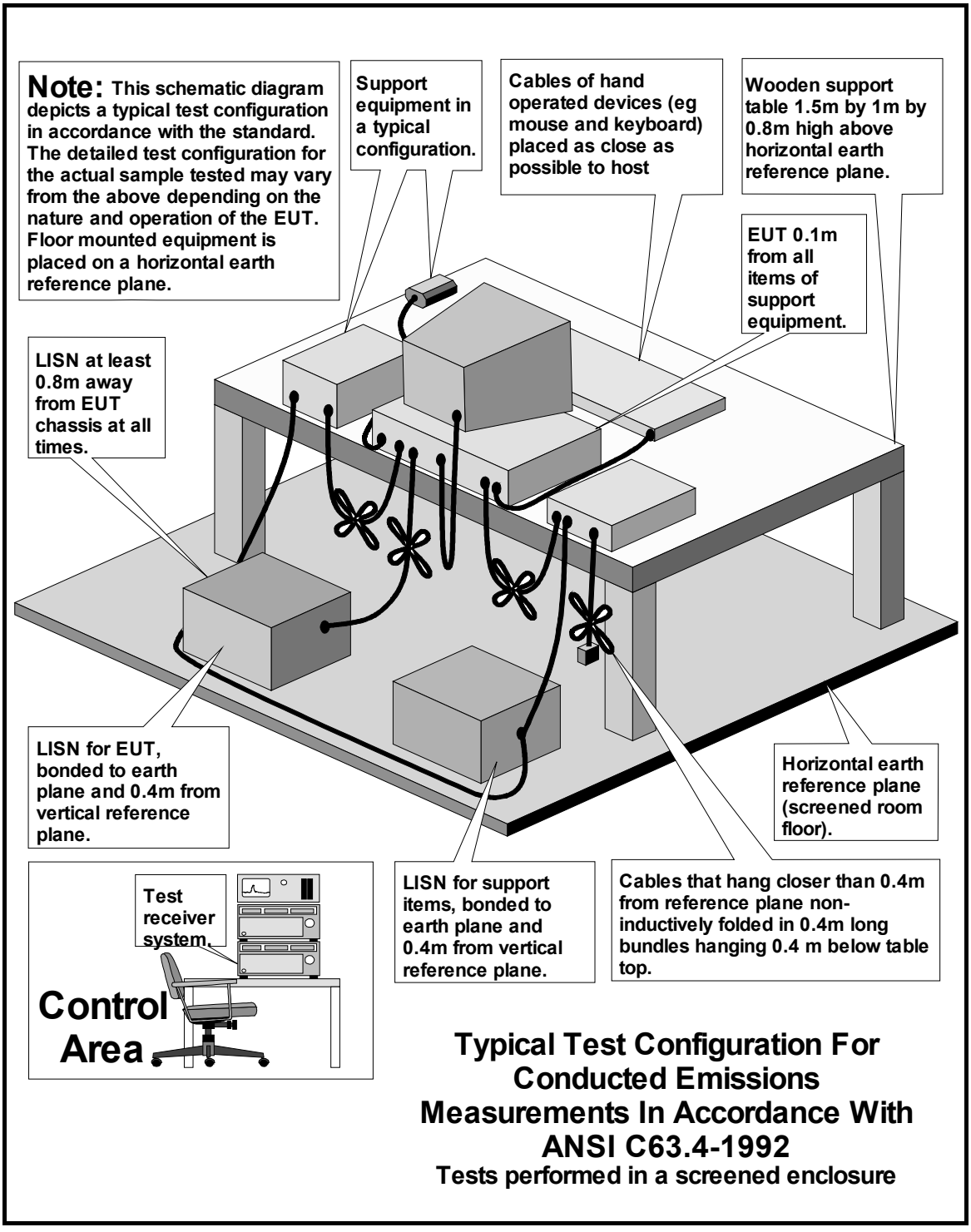
This appendix contains the following drawings:

Drawing Reference Number	Title
DRG\73067JD04\EMICON	Test configuration for measurement of conducted emissions.
DRG\73067JD04\EMIRAD	Test configuration for measurement of radiated emissions.

Test of: Panasonic Mobile Comms Dev of Europe Ltd
P906i

To: FCC Part 15.247: 2007 (Subpart C)

DRG\73067JD04\EMICON



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DRG\73067JD04\EMIRAD