
REPORT ON

Limited FCC CFR 47: Parts 15 C Testing in support of an
Application for Grant of Equipment Authorisation
of a Handheld Products D9500

COMMERCIAL-IN-CONFIDENCE

FCC ID: HD5595009

Report No OR611654/03 Issue 1

March 2004



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DATED

25th March 2004

DISTRIBUTION

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ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47: Part 15 C. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineers;



A Guy



G Lawler





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SECTION 1

REPORT SUMMARY

Limited FCC CFR 47: Part 15 C Testing in support of an
Application for Grant of Equipment Authorisation
Of a Handheld D9500



1.1 STATUS

EQUIPMENT UNDER TEST	D9500
OBJECTIVE	To undertake measurements to determine the Equipment Under Test's (EUT's) compliance with the specification.
NAME AND ADDRESS OF CLIENT	Handheld Products 700 Visions Drive PO Box 208 Skaneateles Falls NY 13153-0208
TYPE NUMBER	D9500
PART NUMBER	D9500-09
SERIAL NUMBER	000001869
HARDWARE VERSION	Rev. 2
DECLARED VARIANTS	None
TEST SPECIFICATION / ISSUE / DATE	FCC CFR 47: Part 15, Subpart C, August 2002
NUMBER OF ITEMS TESTED	One
SECURITY CLASSIFICATION OF EUT	Commercial In Confidence
INCOMING RELEASE DATE	Declaration of Build Status 22 nd March 2004
DISPOSAL REFERENCE NUMBER DATE	Held pending disposal Not Applicable Not Applicable
ORDER NUMBER DATE	DO 93486-00 1 st September 2003
START OF TEST	26 th February 2004
FINISH OF TEST	6 th March 2004
RELATED DOCUMENTS	ANSI C63.4 2001. Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz. FCC Public Notice document (DA 00-705 released 30 March 2000)



1.2 INTRODUCTION

The information contained within this report is intended to show limited verification of compliance of the Hand Held Products D9500 to the requirements of FCC Specification Part 15 C.

Testing was carried out in support of an application for Grant of Equipment Authorisation in the name of Hand Held Products.



1.2.1 DECLARATION OF BUILD STATUS

MAIN EUT			
MANUFACTURING DESCRIPTION	Mobile Computer		
MANUFACTURER	Hand Held Products Inc.		
COUNTRY OF ORIGIN	USA		
TYPE	Dolphin 9500		
PART NUMBER	D9500-09		
SERIAL NUMBER	000001869		
HARDWARE VERSION	Revision 2		
FCC ID	HD5950009		
INDUSTRY CANADA ID	1693B9509		
RADIO MODULES INTEGRATED	GSM/GPRS 900/1800/1900, 802.11b, Bluetooth		
TECHNICAL DESCRIPTION	Hand held computer with 3 radios		
BATTERY/POWER SUPPLY			
MANUFACTURING DESCRIPTION	Rechargeable battery		
MANUFACTURER	Hand Held Products Inc.		
COUNTRY OF ORIGIN	USA		
TYPE	Li-ion		
PART NUMBER	20000591-01		
VOLTAGE	7.4V		
UK AGENT	N/A		
RADIO MODULES			
MANUFACTURING DESCRIPTION	GPRS/GSM Tri-Band Radio Module	802.11b WLAN Radio Module	Bluetooth Radio Module
MANUFACTURER	Siemens AG	Sychip	Socket Communications
COUNTRY OF ORIGIN	Germany	Not known	Japan
TYPE	MC45	WLAN6060EB	BC01
POWER	3.2 – 4.5V	3.0 – 3.6V	2.7 – 3.3V
TRANSMITTER OPERATING RANGE	880-915 / 1710-1785 / 1850-1910	2412MHz to 2462MHz	2402MHz to 2480MHz
TRANSMITTER POWER	2W (GSM900) / 1W (GSM1800/1900)	14.5dBm typical	2bBm typical
RECEIVER OPERATING RANGE	925-960 / 1805-1880 / 1930-1990	2414MHz to 2484MHz	2402MHz to 2480MHz
INTERMEDIATE FREQUENCIES	Receiver: 0; Transmitter: 80MHz	Direct Conversion	Not known
EMISSION DESIGNATOR	GXW	11MOF9W	Not known
DHSS/FHSS/COMBINED OR OTHER	GSM	DSSS	FHSS
FCC ID	QIPMC45	QPUWLAN6060EBK	LUBBTM-1
INDUSTRY CANADA ID			
ANCILLARIES			
MANUFACTURING DESCRIPTION	None		
MANUFACTURER			
TYPE			
PART NUMBER			
SERIAL NUMBER			
HARDWARE VERSION			
COUNTRY OF ORIGIN			
UK AGENT			

Signature

Date

22nd March 2004

TÜV Product Service Limited formally certifies that the manufacturer's declaration as reproduced in this report, is a true and accurate record of the original received from the applicant.



1.3 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out is shown below.

Test	Spec Clause	Test Description	Result	Levels/Comments
2.1	15.205	Measurement at Band Edge (Marker Delta Method)	Pass	
2.2	15.247(b)(3)	Maximum Peak Output Power	Pass	
2.3	15.247(c)	Spurious Radiated Emissions	Pass	



1.4 OPINIONS AND INTERPRETATIONS

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.



1.5 PRODUCT INFORMATION

1.5.1 Technical Description

The Equipment Under Test (EUT) was a D9500, which offers 2.4GHz 802.11b Wireless LAN, Bluetooth A, GSM 900, DCS 1800 and PCS 1900 connectivity.

The terminal utilises the approved HHP Compact Flash 802.11b RLAN radio card, the Socket Communications Bluetooth Module. FCC ID numbers are detailed in Section 1.2.1 Declaration of Build Status

The radios integrated in this terminal are not designed to operate simultaneously and are therefore tested independently, but are co-located.

1.5.2 Modes of Operation

Modes of operation of the EUT during testing were as follows:

Applicable testing was carried out with the EUT transmitting at maximum power or receiving as detailed in Section 1.5.3 "Test Configuration".

1.5.3 Test Configuration

1.5.3.1 Test Configuration 1– RLAN Mode 1

Channel 1: 2412MHz
Channel 6: 2437MHz
Channel 11: 2462MHz

1.5.3.2 Test Configuration 2 – Bluetooth Mode 2

Channel: 2402MHz
Channel: 2441MHz
Channel: 2480MHz
The Output Power level (controlled by application software) was set to level 255.

**1.6 TEST CONDITIONS**

For all tests, the Handheld Products D9500 was powered by its own internal battery.

1.7 DEVIATIONS FROM THE STANDARD

Not Applicable

1.8 MODIFICATION RECORD

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
0	As supplied by the customer	N/A	N/A



SECTION 2

TEST DETAILS

Limited FCC CFR 47: Part 15 C Testing in support of an
Application for Grant of Equipment Authorisation
Of a Handheld Products D9500



2.1 MEASUREMENT AT THE BAND EDGE (MARKER DELTA METHOD)

2.1.1 Specification Reference

FCC CFR 47: Part 15 Subpart C, Section 15.205

2.1.2 Equipment Under Test

D9500

2.1.3 Date of Test

29th February 2004

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified as "Section 2.1" within the Test Equipment Used table shown in Section 3.1.

2.1.5 Test Procedure

Test Performed in accordance with FCC Public Notice document (DA 00-705 released 30 March 2000)



2.1.6 Test Results - (Continued)

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.205 for Band Edge Measurements.

Measurements were made with the EUT in RLAN Mode.

Step 1

Bottom Channel Fundamental Field Strength Measurement.

The Carrier Frequency was maximised to a peak level utilising a Resolution Bandwidth of 1MHz and Video Bandwidth of 1MHz. Average measurements were then performed utilising a Resolution Bandwidth of 1MHz and Video Bandwidth of 10Hz.

Frequency	Antenna Polarisation	Height	Azimuth	Peak Field Strength	Average Field Strength
MHz	H/V	cm	Deg	dB μ V/m	dB μ V/m
2412	V	121	007	104.9	97.4

Step 2

Determine Marker delta amplitude between 2412MHz (the fundamental) and 2390MHz (the Band Edge under investigation).

Using a span of 30MHz with Resolution Bandwidth and Video Bandwidth of 300kHz.

Marker Delta Amplitude = 52.5dB

Step 3

By subtracting the Marker Delta obtained from Step 2 from the 2412MHz Field Strength measurement from Step 1, gives following Result:

Peak of 52.5dB μ V/m (Limit is 74.0dB μ V/m)

Average of 44.9dB μ V/m (Limit is 54.0dB μ V/m)



2.1.6 Test Results - continued

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.205 for Band Edge Measurements.

Measurements were made with the EUT in RLAN Mode.

Step 1

Top Channel Fundamental Field Strength Measurement

The Carrier Frequency was maximised to a peak level utilising a Resolution Bandwidth of 1MHz and Video Bandwidth of 1MHz. Average measurements were then performed utilising a Resolution Bandwidth of 1MHz and Video Bandwidth of 10Hz.

Frequency	Antenna Polarisation	Height	Azimuth	Peak Field Strength	Average Field Strength
MHz	H/V	cm	Deg	dB μ V/m	dB μ V/m
2462	V	110	183	103.7	100.7

Step 2

Determine Marker delta amplitude between 2462MHz (the fundamental) and 2483.5MHz (the Band Edge under investigation).

Using a span of 30MHz with Resolution Bandwidth and Video Bandwidth of 300kHz.

Marker Delta Amplitude = 52.1dB

Step 3

By subtracting the Marker Delta obtained from Step 2 from the 2462MHz Field Strength measurement from Step 1, gives following Result

Peak of 51.6dB μ V/m (Limit is 74.0dB μ V/m)

Average of 48.6dB μ V/m (Limit is 54.0dB μ V/m)



2.1.6 Test Results – continued

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.205 for Band Edge Measurements.

Measurements were made with the EUT in Bluetooth Mode.

Step 1

Bottom Channel Fundamental Field Strength Measurement.

The Carrier Frequency was maximised to a peak level utilising a Resolution Bandwidth of 1MHz and Video Bandwidth of 1MHz. Average measurements were then performed utilising a Resolution Bandwidth of 1MHz and Video Bandwidth of 10Hz.

Frequency	Antenna Polarisation	Height	Azimuth	Peak Field Strength	Average Field Strength
MHz	H/V	cm	Deg	dB μ V/m	dB μ V/m
2402	H	100	056	83.1	81.8

Step 2

Determine Marker delta amplitude between 2402MHz (the fundamental) and 2390MHz (the Band Edge under investigation).

Using a span of 30MHz with Resolution Bandwidth and Video Bandwidth of 300kHz.

Marker Delta Amplitude = 33dB

Step 3

By subtracting the Marker Delta obtained from Step 2 from the 2402MHz Field Strength measurement from Step 1, gives following Result:

Peak of 50.1dB μ V/m (Limit is 74.0dB μ V/m)

Average of 48.8dB μ V/m (Limit is 54.0dB μ V/m)



2.1.6 Test Results - continued

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.205 for Band Edge Measurements.

Measurements were made with the EUT in Bluetooth Mode.

Step 1

Top Channel Fundamental Field Strength Measurement.

The Carrier Frequency was maximised to a peak level utilising a Resolution Bandwidth of 1MHz and Video Bandwidth of 1MHz. Average measurements were then performed utilising a Resolution Bandwidth of 1MHz and Video Bandwidth of 10Hz.

Frequency	Antenna Polarisation	Height	Azimuth	Peak Field Strength	Average Field Strength
MHz	H/V	cm	Deg	dB μ V/m	dB μ V/m
2480	V	107	276	79.2	78.4

Step 2

Determine Marker delta amplitude between 2462MHz (the fundamental) and 2483.5MHz (the Band Edge under investigation).

Using a span of 30MHz with Resolution Bandwidth and Video Bandwidth of 300kHz.

Marker Delta Amplitude = 27.2dB

Step 3

By subtracting the Marker Delta obtained from Step 2 from the 2480MHz Field Strength measurement from Step 1, gives following Result

Peak of 52.0dB μ V/m (Limit is 74.0dB μ V/m)

Average of 51.2dB μ V/m (Limit is 54.0dB μ V/m)



2.2 MAXIMUM PEAK OUTPUT POWER (EIRP Method)

2.2.1 Specification Reference

FCC CFR 47: Part 15 Subpart C, Section 15.247(b)(3)

2.2.2 Equipment Under Test

D9500

2.2.3 Date of Test

27th February 2004

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified as “Section 2.2” within the Test Equipment Used table shown in Section 3.1.

2.2.5 Test Procedure

Test Performed in accordance with FCC CFR 47: Part 15.247(b)(1).

The EUT contains an integral antenna and therefore the Maximum Peak Output Power was made using the EIRP method.

The Spectrum Analyser was tuned to the test frequency. The device Output Power setting was controlled as specified in the Product Information, Section 1.5 of this document. The device was then rotated through 360 degrees until the highest power level was observed in both horizontal and vertical polarisation. The device was then replaced with a substitution antenna, whose input signal level into the antenna was adjusted until the received level matched that of the previously detected emission.



2.2 MAXIMUM PEAK OUTPUT POWER (EIRP Method) - continued

2.2.6 Test Results

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.247(b)(3) for Maximum Peak Output Power.

Measurements were made with the EUT in RLAN Mode.

Frequency (MHz)	Result EIRP (dBm)	Result EIRP (mW)
2412	12.22	16.67
2437	14.0	25.3
2462	14.5	28.0
Limit	<+36dBm or <4W	

Measurements were made with the EUT in Bluetooth Mode.

Frequency (MHz)	Result EIRP (dBm)	Result EIRP (μ W)
2402	-15.6	27.5
2441	-15.7	26.9
2480	-15.6	27.5
Limit	<+36dBm or <4W	



2.3 SPURIOUS RADIATED EMISSIONS

2.3.1 Specification Reference

FCC CFR 47: Part 15 Subpart C, Section 15.247(c)

2.3.2 Equipment Under Test

D9500

2.3.3 Date of Test

6th March 2004

2.3.4 Test Equipment Used

The major items of test equipment used for the above tests are identified as “Section 2.3” within the Test Equipment Used table shown in Section 3.1.

2.3.5 Test Procedure

Test Performed in accordance with ANSI C63.4.

FCC CFR 47: Part 15 Subpart C, Section 15.247(c), for Radiated Emissions also requires Sections 15.205 and 15.209 to be applied.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT. The list of emissions was then confirmed or updated under Alternative Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

Emissions identified within the range 30MHz – 1GHz were then formally measured using a CISPR Quasi-Peak detector.

Emissions identified within the range 1GHz – 26GHz were then formally measured using Peak and Average Detectors, as appropriate.

The measurements were performed at a 3m distance unless otherwise stated.



2.3 SPURIOUS RADIATED EMISSIONS - continued

2.3.6 Test Results

30MHz - 1GHz Frequency Range

Equipment Designation: Intentional Radiator.

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.247(c), 15.205 and 15.209 for Radiated Emissions (30MHz – 1GHz).

EUT Tx on Bottom Channel (2412MHz)

Measurements were made with the EUT in RLAN Mode.

Emission Frequency	Pol	Hgt	Azm	Field Strength at 3m		Specification Limit	
MHz	H/V	cm	deg	dBμV/m	μV/m	dBμV/m	μV/m
423.0	H	100	079	30.4	33.1	46.0	500
447.9	H	235	278	32.6	42.7	46.0	500
796.3	H	100	330	32.7	43.2	46.0	500
808.5	H	100	315	32.8	43.7	46.0	500
821.1	H	105	311	32.8	43.7	46.0	500
842.5	H	110	317	33.5	47.3	46.0	500

EUT Tx on Middle Channel (2437MHz)

Measurements were made with the EUT in RLAN Mode.

Emission Frequency	Pol	Hgt	Azm	Field Strength at 3m		Specification Limit	
MHz	H/V	Cm	deg	dBμV/m	μV/m	dBμV/m	μV/m
423.1	H	100	085	31.0	35.5	46.0	500
447.9	H	240	283	32.7	43.2	46.0	500
796.3	H	100	320	33.3	46.2	46.0	500
808.5	H	100	316	32.4	41.7	46.0	500
821.1	H	109	310	32.7	43.2	46.0	500
842.5	H	105	316	32.7	43.2	46.0	500



2.3.6 Test Results – continued

EUT Tx on Top Channel (2462MHz)

Measurements were made with the EUT in RLAN Mode.

Emission Frequency MHz	Pol H/V	Hgt cm	Azm deg	Field Strength at 3m		Specification Limit	
				dBµV/m	µV/m	dBµV/m	µV/m
448.0	H	237	290	33.3	46.2	46.0	500
796.3	H	100	283	32.9	44.2	46.0	500
808.7	H	100	316	33.7	48.4	46.0	500
821.0	H	110	316	33.0	44.7	46.0	500
841.9	H	110	310	32.4	41.7	46.0	500
852.2	H	100	308	31.6	38.0	46.0	500

ABBREVIATIONS FOR ABOVE TABLES

H Horizontal Polarisation
Pol Polarisation
deg degree

V Vertical Polarisation
Hgt Height
Azm Azimuth



2.3.6 Test Results - continued

30MHz - 1GHz Frequency Range

Equipment Designation: Intentional Radiator.

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.247(c), 15.205 and 15.209 for Radiated Emissions (30MHz – 1GHz).

EUT Tx on Bottom Channel (2402MHz)

Measurements were made with the EUT in Bluetooth Mode.

Emission Frequency	Pol	Hgt	Azm	Field Strength at 3m		Specification Limit	
MHz	H/V	cm	deg	dBμV/m	μV/m	dBμV/m	μV/m
659.4	H	107	020	30.2	32.4	46.0	500
671.9	H	108	030	30.7	34.3	46.0	500
721.6	H	106	004	30.3	32.7	46.0	500
771.4	H	100	014	31.0	35.5	46.0	500
796.2	H	100	030	32.2	40.7	46.0	500
839.8	H	100	214	29.5	29.9	46.0	500

EUT Tx on Middle Channel (2441MHz)

Measurements were made with the EUT in Bluetooth Mode.

Emission Frequency	Pol	Hgt	Azm	Field Strength at 3m		Specification Limit	
MHz	H/V	cm	deg	dBμV/m	μV/m	dBμV/m	μV/m
671.8	H	100	018	28.6	26.9	46.0	500
721.6	H	100	024	29.6	30.2	46.0	500
771.4	H	100	005	31.5	37.6	46.0	500
783.9	H	100	006	29.8	30.9	46.0	500
796.3	H	100	010	32.9	44.1	46.0	500
839.8	H	100	235	29.3	29.2	46.0	500

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2.3.6 Test Results – continued

EUT Tx on Top Channel (2480MHz)

Measurements were made with the EUT in Bluetooth Mode.

Emission Frequency	Pol	Hgt	Azm	Field Strength at 3m		Specification Limit	
MHz	H/V	cm	deg	dBµV/m	µV/m	dBµV/m	µV/m
709.2	H	100	008	29.6	30.2	46.0	500
734.1	H	100	360	30.3	32.7	46.0	500
758.9	H	100	015	31.4	37.2	46.0	500
771.4	H	100	009	31.6	38.0	46.0	500
783.8	H	100	001	31.6	38.0	46.0	500
793.3	H	100	000	31.9	39.4	46.0	500

ABBREVIATIONS FOR ABOVE TABLES

H Horizontal Polarisation
 Pol Polarisation
 deg degree

V Vertical Polarisation
 Hgt Height
 Azm Azimuth



2.3.6 Test Results - continued

1GHz - 26GHz Frequency Range

Equipment Designation: Intentional Radiator.

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.247(c), 15.205 and 15.209 for Radiated Emissions (1GHz – 26GHz).

EUT Tx on Bottom Channel (2412MHz)

Measurements were made with the EUT in RLAN mode.

Frequency	Antenna		Turntable	Peak Field Strength	Peak Limit	Average Field Strength	Average Limit
	Pol	Height	Azimuth				
GHz	H/V	cm	Deg	dBµV/m	dBµV/m	dBµV/m	dBµV/m
4.824	H	100	350	50.7	74.0	39.4	54.0
4.824	V	104	329	51.4	74.0	44.7	54.0

EUT Tx on Middle Channel (2437MHz)

Measurements were made with the EUT in RLAN Mode.

Frequency	Antenna		Turntable	Peak Field Strength	Peak Limit	Average Field Strength	Average Limit
	Pol	Height	Azimuth				
GHz	H/V	cm	deg	dBµV/m	dBµV/m	dBµV/m	dBµV/m
4.874	V	101	329	51.3	74.0	44.1	54.0
4.874	H	103	197	50.1	74.0	39.7	54.0

EUT Tx on Top Channel (2462MHz)

Measurements were made with the EUT in RLAN Mode.

Frequency	Antenna		Turntable	Peak Field Strength	Peak Limit	Average Field Strength	Average Limit
	Pol	Height	Azimuth				
GHz	H/V	cm	deg	dBµV/m	dBµV/m	dBµV/m	dBµV/m
4.924	V	100	326	51.7	74.0	43.7	54.0

ABBREVIATIONS FOR ABOVE TABLES

H Horizontal Polarisation
 Pol Polarisation
 deg degree

V Vertical Polarisation
 Hgt Height
 Azm Azimuth



2.3.6 Test Results - continued

1GHz - 26GHz Frequency Range

Equipment Designation: Intentional Radiator.

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.247(c), 15.205 and 15.209 for Radiated Emissions (1GHz – 26GHz).

EUT Tx on Bottom Channel (2402MHz)

Measurements were made with the EUT in Bluetooth Mode.

Frequency	Antenna		Turntable	Peak Field Strength	Peak Limit	Average Field Strength	Average Limit
	Pol	Height	Azimuth				
GHz	H/V	Cm	Deg	dBμV/m	dBμV/m	dBμV/m	dBμV/m
4.804	H	100	123	59.9	74.0	30.6	54.0
4.804	V	108	197	59.2	74.0	30.4	54.0

In accordance with FCC Public Notice DA 00-705, Released 30th March 2000, Section 15.247(c) Spurious Radiated Emissions "If the dwell time per channel of the hopping signal is less than 100ms, then the reading obtained with the 10Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100\text{ms})$, in an effort to demonstrate compliance with the 15.209 limit the following adjustment has been calculated for use with Average Measurements only;

Dwell Time = 5.81ms this is derived from;

Total slot time per time slot for DH5 packet $625\mu\text{s} \times 5 = 3.125\text{ms}$

Actual transmit time during this time slot is 2.905ms and the reply time slot after each DH5 packet is 625μs.

Total time slot length per channel $3.125 + 0.625 = 3.75\text{ms}$

Multiply Total time slot length per channel by 32 channels per hop sequence $32 \times 3.75 = 120\text{ms}$

It is therefore possible to have a maximum of two hop sequences in any given 100ms period, a single channel could occur twice within any 100ms time window. $2 \times 2.905 = 5.81\text{ms}$

Therefore; the Bluetooth Duty Cycle Correction Factor for the EUT is $20 \log (5.81/100) = -24.7\text{dB}$



2.3.6 Test Results - continued

1GHz - 26GHz Frequency Range - continued

Equipment Designation: Intentional Radiator.

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.247(c), 15.205 and 15.209 for Radiated Emissions (1GHz – 26GHz).

EUT Tx on Middle Channel (2441MHz)

Measurements were made with the EUT in Bluetooth Mode.

Frequency	Antenna		Turntable	Peak Field Strength	Peak Limit	Average Field Strength	Average Limit
	Pol	Height	Azimuth				
GHz	H/V	Cm	deg	DB μ V/m	DB μ V/m	dB μ V/m	dB μ V/m
4.882	H	100	126	54.1	74.0	48.2	54.0

EUT Tx on Top Channel (2480MHz)

Measurements were made with the EUT in Bluetooth Mode.

No emissions were detected above the noise floor of the measuring system.



2.3 SPURIOUS RADIATED EMISSIONS - continued

2.3.7 Set Up Photograph



Set Up Photograph



SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

Item	Instrument	Manufacturer	Type No	EMC / INV No	Cal. Due
Section 2.1					
1	Turntable & Controller	HD Gmbh	HD 050	2528	TU
2	Antenna Mast	EMCO	2070	-	TU
3	Antenna Mast Controller	EMCO	2090	-	TU
4	Spectrum Analyser	Rhode & Schwarz	ESIB40	2917	11-2-05
5	Horn	EMCO	3115	2397	4-7-04
6	Signal Generator	Hewlett Packard	8673B	954	14-6-04
7	Attenuator	Hewlett Packard	8491B	-	TU
Section 2.2					
8	Peak Power Analyser	Hewlett Packard	8990A	1670	14-8-04
9	Spectrum Analyser	Rhode & Schwarz	ESIB40	2917	11-2-05
10	Horn	EMCO	3115	2397	4-7-04
11	Horn	EMCO	3115	2297	4-7-04
Section 2.3					
12	Turntable & Controller	HD Gmbh	HD 050	2528	TU
13	Antenna Mast	EMCO	2070	-	TU
14	Antenna Mast Controller	EMCO	2090	-	TU
15	Spectrum Analyser	Rhode & Schwarz	ESIB40	2917	11-2-05
16	Horn	EMCO	3115	2397	4-7-04
17	Signal Generator	Hewlett Packard	8673B	954	14-6-04
18	Low Noise Amplifier 1-8GHz	Miteq	AMF-3D-001080-18-13P	2457	TU
19	Amplifier 8-18GHz	Avantek	AWT 18036	1081	26-6-04
20	Amplifier 18-26GHz	Avantek	AMT 26177-33	2072	26-6-04
21	Hydrometer	Rotronic	A1	INV3155	28-8-04
22	Bilog Antenna	Chase	CBL6143	2860	11-4-04
23	Antenna	FMI	2024-20	1396	TU

TU: Traceability Unscheduled



3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

IN THE FREQUENCY RANGE 30MHz TO 1000MHz		
TEST	FREQUENCY	AMPLITUDE
For Radiated Emissions, Quasi-Peak Measurements taken in Zero Span using the Hewlett Packard EMI Receiver and Bilog Antenna	$\pm 2 \times 10^{-7} \times \text{Centre Frequency}$	5.15dB calculated in accordance with CISPR 16-4
IN THE FREQUENCY RANGE 1GHz TO 26GHz		
TEST	FREQUENCY	AMPLITUDE
For Spurious Radiated Emissions measurements	$\pm 2 \times 10^{-7} \times \text{Centre Frequency}$	$\pm 3.4\text{dB}$
For Peak Power Spectral Density	Not Applicable	$\pm 1.8\text{dB}$
For Effective Radiated Power (ERP) measurements	Not Applicable	$\pm 1.45\text{dBm}$



SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA
(Not UKAS Accredited).

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APPENDIX A

TITCHFIELD FCC SITE COMPLIANCE LETTER



FEDERAL COMMUNICATIONS COMMISSION

**Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046**

October 18, 2002

Registration Number: 90987

TUV Product Service Ltd
Segensworth Road
Titchfield
Fareham, Hampshire, PO15 5RH
United Kingdom
Attention: Kevan Adsetts

Re: Measurement facility located at Titchfield
Anechoic chamber (3 meters) and 3 & 10 meter OATS
Date of Listing: October 18, 2002

Gentlemen:

Your request for registration of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC rules. The information has, therefore, been placed on file and the name of your organization added to the list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that the file must be updated for any changes made to the facility and the registration must be renewed at least every three years.

Measurement facilities that have indicated that they are available to the public to perform measurement services on a fee basis may be found on the FCC website www.fcc.gov under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,

Thomas W Phillips
Electronics Engineer