
REPORT ON

Limited FCC CFR 47: Part 15 C Testing in support of an
Application for Grant of Equipment Authorisation
of a Symbol 41210000 Hand Held Data Terminal

FCC ID: H9P41210000

Report No OR612329/05 Issue 1

October 2004

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PREPARED FOR Symbol Technologies Inc
One Symbol Plaza
Holtsville
NY 11742-1300
New York
United States of America

PREPARED BY



J Plummer
Technical Author

APPROVED BY



C Gould
Chief Engineer, EMC Group

DATED

12-10-04

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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 Symbol 41210000 Hand Held Data Terminal



1.1 STATUS

EQUIPMENT UNDER TEST	Hand Held Data Terminal
OBJECTIVE	To undertake measurements to determine the Equipment Under Test's (EUT's) compliance with the specification.
NAME AND ADDRESS OF CLIENT	Symbol Technologies Inc One Symbol Plaza Holtsville 11742-1300, New York United States of America
TYPE NUMBER	41210000
PART NUMBER	412100000
SERIAL NUMBER	SAMP-0001 (FCC 2)
HARDWARE VERSION	Rev 1 (To be released as Rev A)
DECLARED VARIANTS	None
TEST SPECIFICATION ISSUE/DATE	FCC CFR 47: Part 15, Subpart C October 2003
NUMBER OF ITEMS TESTED	One
SECURITY CLASSIFICATION OF EUT	Commercial In Confidence
INCOMING RELEASE DATE	Declaration of Build Status 10 th September 2004
DISPOSAL REFERENCE NUMBER DATE	Held pending disposal Not Applicable Not Applicable
ORDER NUMBER	PTP, 17 th September 2004
START OF TEST	17 th September 2004
FINISH OF TEST	24 th September 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 Symbol Technologies Inc 41210000 Hand Held Data Terminal 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 Symbol Technologies Inc.



1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The unit supplied for testing was a 41210000 hand held data terminal, which offers 2.4GHz 802.11b Wireless LAN and Bluetooth connectivity.

The terminal utilizes the approved LA-4137 Symbol Compact Flash 802.11b RLAN radio card and the 21-64381 Symbol Bluetooth module. FCC ID numbers are detailed in Section 1.3.4 "Declaration of Build Status".

1.3.2 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 1.3.3 "Test Configuration".

The client has declared that the Symbol 21-64436 (RLAN) and the Symbol 21-64381 (Bluetooth) Modules are co-located, but that they are not capable of simultaneously transmitting.

1.3.3 Test Configuration

1.3.3.1 RLAN Mode

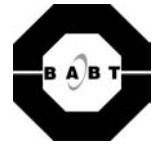
The EUT was running the program Symbol Trilogy-24 Diagnostics Test Tool T24CE.exe, which enabled the test engineer to select transmit or receive on the following channels and frequencies;

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

1.3.3.2 Bluetooth Mode

The EUT was running the program Symbol Bluetooth Test Tool BTTools.exe, which enabled the test engineer to select transmit or receive on the following channels and frequencies;

Channel 2:	2402MHz
Channel 41:	2441MHz
Channel 80:	2480MHz



1.3.4 DECLARATION OF BUILD STATUS

MAIN EUT		
MANUFACTURING DESCRIPTION	Hand Held Terminal	
MANUFACTURER	Symbol Technologies Inc	
TYPE	41210000	
PART NUMBER	412100000	
SERIAL NUMBER	SAMP-0001 (FCC2) & SAMP-0007 (Dot Spare)	
HARDWARE VERSION	Rev 1 (to be released as Rev A)	
FCC ID	H9P41210000	
INDUSTRY CANADA ID	1549D-41210000	
TECHNICAL DESCRIPTION	The unit supplied for testing was a 41210000 hand held data terminal, which offers 2.4GHz 802.11b Wireless LAN and Bluetooth connectivity. The terminal utilizes the approved LA-4137 Symbol Compact Flash 802.11b RLAN radio card and the 21-64831 Symbol Bluetooth module.	
BATTERY/POWER SUPPLY		
CHEMISTRY	Li Ion	
PART NUMBER	21-59510-02	
VOLTAGE	7.2v	
MODULES		
MANUFACTURING DESCRIPTION	RLAN Module	Bluetooth Marlin Module
MANUFACTURER	Symbol Technologies Inc	Symbol Technologies Inc
TYPE	LA4137	21-64381
TRANSMITTER OPERATING BAND	2400-2483.5 MHz	2400-2483.5 MHz
RECEIVER OPERATING BAND	2400-2483.5 MHz	2400-2483.5 MHz
ITU DESIGNATION OF EMISSION	11M0F1D	1M00F1D
POWER	100mW	100mW (restricted in this terminal integration to 1 mW)
DHSS/FHSS/COMBINED OR OTHER	DSSS	FHSS
FCC ID	H9PLA4137	H9P2164381

Signature

Date
D of B S Serial No

10th September 2004
OS612329-02

The unit used for the internal photographs in this report was not the EUT, but was supplied as an identical unit for photographs only. It is declared as being the same build status as the EUT.

BABT 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.



1.4 BRIEF SUMMARY OF RESULTS

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

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	Pass	RLAN MODE
2.2	15.207	Conducted Emissions on Power Lines	Pass	RLAN MODE
2.3	15.247(b)(3)	Maximum Peak Output Power	Pass	RLAN MODE
2.4	15.247(c)	Spurious Radiated Emissions	Pass	RLAN MODE
2.5	15.205	Measurement at Band Edge	Pass	BLUETOOTH MODE
2.6	15.207	Conducted Emissions on Power Lines	Pass	BLUETOOTH MODE
2.7	15.247(b)(3)	Maximum Peak Output Power	Pass	BLUETOOTH MODE
2.8	15.247(c)	Spurious Radiated Emissions	Pass	BLUETOOTH MODE



1.5 OPINIONS AND INTERPRETATIONS

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

1.6 TEST CONDITIONS

The EUT was set-up simulating a typical user installation and was tested in accordance with the applicable specification.

For all tests, with the exception of Conducted Emissions on the Power Lines, the Symbol 41210000 Hand Held Data Terminal was powered by its own internal battery.

For Conducted Emissions on Power Lines the EUT was configured as described in Section 1.3.3, but it was powered via a Symbol 41210000 Hand Held Data Terminal Charger, this in turn was powered by a Symbol 50-24000-006 120V, 60Hz Power Supply.

1.7 DEVIATIONS FROM THE STANDARD

Not Applicable.

1.8 MODIFICATION RECORD

Not Applicable.

1.9 ALTERNATIVE TEST SITE

No alternative test site was used.



SECTION 2

TEST DETAILS RLAN MODE

Limited FCC CFR 47: Part 15 C Testing in support of an
Application for Grant of Equipment Authorisation
Of a Symbol 41210000 Hand Held Data Terminal



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

41210000 Hand Held Data Terminal

2.1.3 Date of Test

20th September 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 MEASUREMENT AT THE BAND EDGE (MARKER DELTA METHOD) - continued

2.1.6 Test Results

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 (see Section 1.3.3 for details).

Step 1

Bottom Channel Fundamental Field Strength Measurement.

Peak measurements performed utilising a Resolution Bandwidth and Video Bandwidth of 1MHz. Average measurements 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	H	109	050	107.1	98.5

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 = 51.6dB

Step 3

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

Peak of 55.5dB μ V/m (Limit is 74.0dB μ V/m)

Average of 46.9dB μ V/m (Limit is 54.0dB μ V/m)

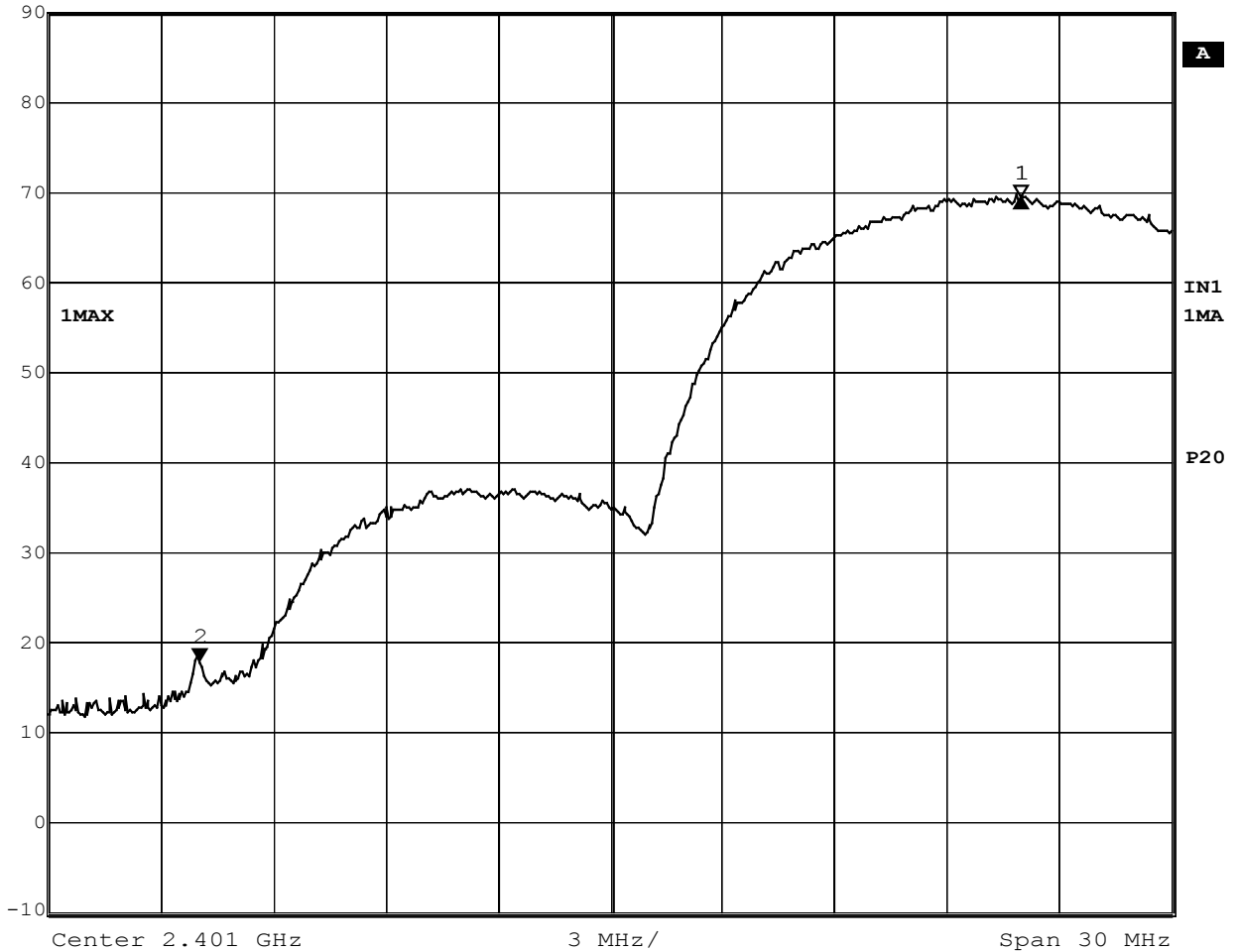


2.1 MEASUREMENT AT THE BAND EDGE (MARKER DELTA METHOD) - continued

2.1.6 Test Results - continued

Plot for RLAN Bottom Channel 2412MHz

	Max/Ref Lvl	Delta 1 [T1]	RBW	300 kHz	RF Att	0 dB
	90 dB μ V	51.56 dB	VBW	300 kHz		
	72 dB μ V	21.97194389 MHz	SWT	5 ms	Unit	dB μ V



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2.1 MEASUREMENT AT THE BAND EDGE (MARKER DELTA METHOD) - continued

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 (see Section 1.3.3 for details).

Step 1

Top Channel Fundamental Field Strength Measurement.

Peak measurements performed utilising a Resolution Bandwidth and Video Bandwidth of 1MHz.
Average measurements 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	H	106	184	108.2	98.9

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 = 58.6dB

Step 3

Subtracting the Marker Delta obtained from Step 2 from the 2483.5MHz Field Strength measurement from Step 1, gives following Result

Peak of 49.6dB μ V/m (Limit is 74.0dB μ V/m)

Average of 40.3dB μ V/m (Limit is 54.0dB μ V/m)

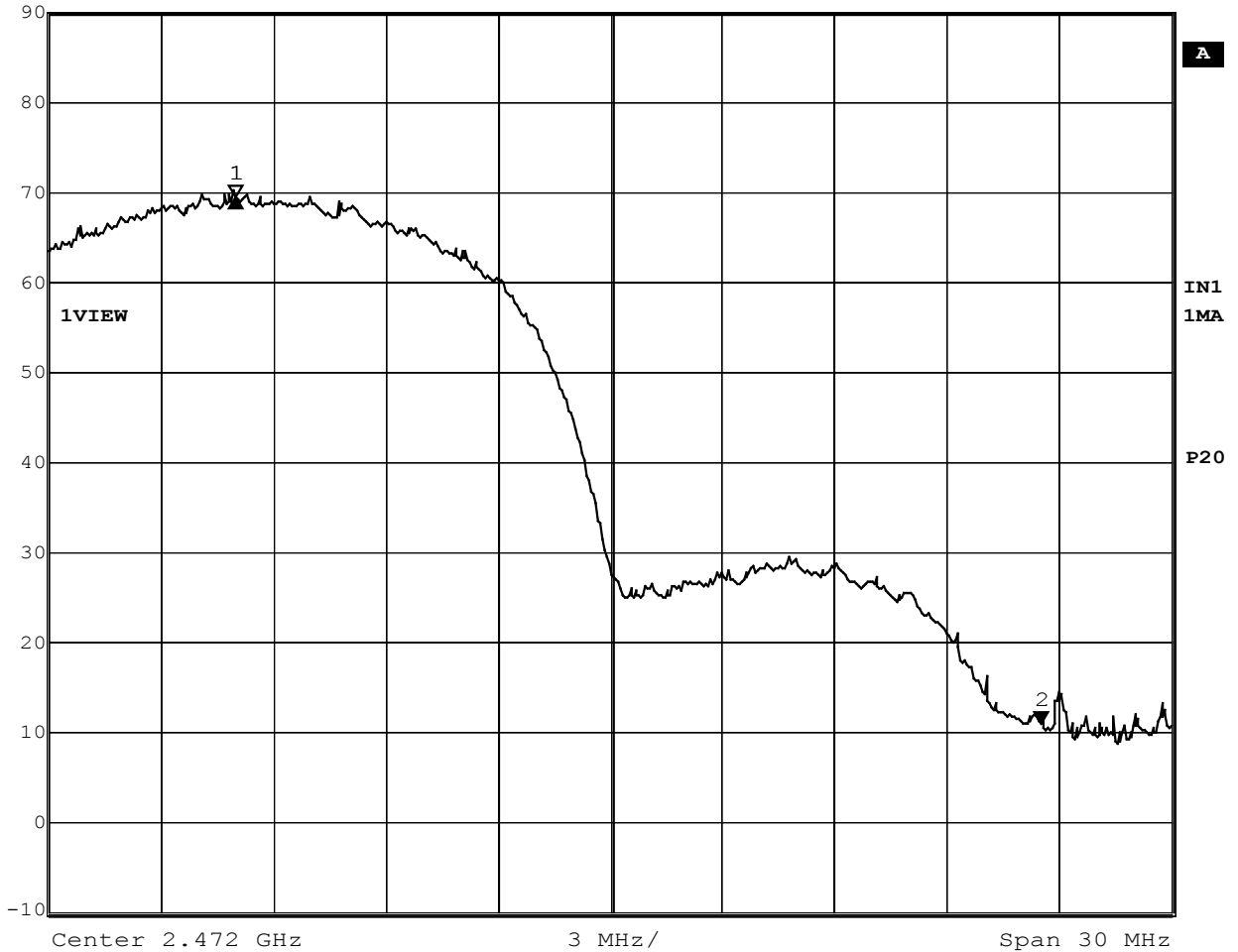


2.1 MEASUREMENT AT THE BAND EDGE (MARKER DELTA METHOD) - continued

2.1.6 Test Results - continued

Plot for RLAN Top Channel 2462MHz

	Max/Ref Lvl	Delta 1 [T1]	RBW	300 kHz	RF Att	0 dB
	90 dB μ V	58.59 dB	VBW	300 kHz		
	72 dB μ V	-21.50000000 MHz	SWT	5 ms	Unit	dB μ V



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2.2 CONDUCTED EMISSIONS ON POWER LINES

2.2.1 Specification Reference

FCC CFR 47: Part 15 Subpart C, Section 15.207

2.2.2 Equipment Under Test

41210000 Hand Held Data Terminal

2.3.3 Date of Test

23rd September 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 ANSI C63.4.

Conducted Emission Measurements were undertaken within the semi-anechoic chamber. Emissions were measured on the Live and Neutral Lines in turn.

Emissions were formally measured using a Quasi-Peak and Average Detectors, which meet the CISPR requirements. The details of the worst-case emissions for the Live and Neutral Lines are presented in the following tables.

The EUT was supplied via the Charger from a 120V, 60Hz supply.



2.2 CONDUCTED EMISSIONS ON POWER LINES - continued

2.2.6 Test Results

The EUT met the Class B requirements of FCC CFR 47: Part 15 Subpart C, Section 15.207 for Conducted Emissions on the Live and Neutral Lines.

Measurements were made with the EUT in RLAN Mode (see Section 1.3.3 for details).

EUT Tx on Bottom Channel (2412MHz) – Live Line

Emission Frequency (MHz)	Average Level (dB μ V)	Quasi-Peak Level (dB μ V)	Average Limit (dB μ V)	Quasi-Peak Limit (dB μ V)
0.1500	25.4	46.4	56.0	66.0
0.1787	35.9	48.9	54.5	64.5
0.2128	32.9	43.8	53.1	63.1
0.2844	31.1	39.7	50.7	60.7
2.4842	27.7	33.4	46.0	56.0
20.8310	38.4	41.7	50.0	60.0

The margin between the specification requirements and all other emissions were 22.4dB or more below the specified Quasi-Peak limit and 30.4dB or more below the Average limit.

EUT Tx on Bottom Channel (2412MHz) – Neutral Line

Emission Frequency (MHz)	Average Level (dB μ V)	Quasi-Peak Level (dB μ V)	Average Limit (dB μ V)	Quasi-Peak Limit (dB μ V)
0.1500	25.0	46.3	56.0	66.0
0.2129	33.5	44.3	53.1	63.1
0.2484	32.1	40.2	51.8	61.8
2.4489	30.4	35.8	51.9	61.9
2.6968	31.0	36.3	46.0	56.0
20.8310	35.2	40.9	50.0	60.0

The margin between the specification requirements and all other emissions were 21.6dB or more below the specified Quasi-peak limit and 30.8dB or more below the specified Average limit.



2.2 CONDUCTED EMISSIONS ON POWER LINES - continued

2.2.6 Test Results - continued

EUT Tx on Middle Channel (2437MHz) – Live Line

Emission Frequency (MHz)	Average Level (dB μ V)	Quasi-Peak Level (dB μ V)	Average Limit (dB μ V)	Quasi-Peak Limit (dB μ V)
0.1500	25.8	46.5	56.0	66.0
0.1593	24.8	44.7	55.5	65.5
0.1668	23.7	44.0	55.1	65.1
0.1780	35.4	48.7	54.6	64.6
0.2129	33.2	44.4	53.1	63.1
20.7179	39.6	43.6	50.0	60.0

The margin between the specification requirements and all other emissions were 21.2dB or more below the specified Quasi-Peak limit and 39.6dB or more below the Average limit.

EUT Tx on Middle Channel (2437MHz) – Neutral Line

Emission Frequency (MHz)	Average Level (dB μ V)	Quasi-Peak Level (dB μ V)	Average Limit (dB μ V)	Quasi-Peak Limit (dB μ V)
0.1500	25.4	46.5	56.0	66.0
0.1776	35.9	48.9	54.6	64.6
0.2128	33.7	44.5	53.1	63.1
0.2484	32.8	40.5	51.8	61.8
2.4840	29.7	34.4	46.0	56.0
20.7179	39.7	43.3	50.0	60.0

The margin between the specification requirements and all other emissions were 21.4dB or more below the specified Quasi-peak limit and 30.4dB or more below the specified Average limit.



2.2 CONDUCTED EMISSIONS ON POWER LINES - continued

2.2.6 Test Results - continued

EUT Tx on Top Channel (2462MHz) – Live Line

Emission Frequency (MHz)	Average Level (dB μ V)	Quasi-Peak Level (dB μ V)	Average Limit (dB μ V)	Quasi-Peak Limit (dB μ V)
0.1500	25.8	46.7	56.0	66.0
0.1776	38.8	50.2	54.6	64.6
0.2126	33.8	44.5	53.1	63.1
0.2477	35.7	37.0	51.8	61.8
2.5123	26.4	30.6	46.0	56.0
20.7054	58.7	31.8	50.0	60.0

The margin between the specification requirements and all other emissions were 28.2dB or more below the specified Quasi-Peak limit and 30.0dB or more below the Average limit.

EUT Tx on Top Channel (2462MHz) – Neutral Line

Emission Frequency (MHz)	Average Level (dB μ V)	Quasi-Peak Level (dB μ V)	Average Limit (dB μ V)	Quasi-Peak Limit (dB μ V)
0.1502	23.1	41.9	56.0	66.0
0.1664	18.3	39.9	55.2	65.2
0.1824	23.7	38.1	54.4	64.4
0.2125	35.9	41.8	53.1	63.1
2.6199	27.5	30.3	46.0	56.0
20.5689	30.7	33.2	50.0	60.0

The margin between the specification requirements and all other emissions were 26.8dB or more below the specified Quasi-Peak limit and 36.8dB or more below the Average limit.



2.3 MAXIMUM PEAK OUTPUT POWER (EIRP Method)

2.3.1 Specification Reference

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

2.3.2 Equipment Under Test

41210000 Hand Held Data Terminal

2.2.3 Date of Test

20th September 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.

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, who's input signal level into the antenna was adjusted until the received level matched that of the previously detected emission.



2.3 MAXIMUM PEAK OUTPUT POWER (EIRP Method) - continued

2.3.6 Test Results - continued

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 (see Section 1.3.3 for details).

Frequency (MHz)	Result EIRP (dBm)	Result EIRP (mW)
2412	14.7	29.5
2437	12.4	17.4
2462	10.4	11.0
Limit	<+36dBm or <4W	



2.4 SPURIOUS RADIATED EMISSIONS

2.4.1 Specification Reference

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

2.4.2 Equipment Under Test

41210000 Hand Held Data Terminal

2.3.3 Date of Test

20th – 22nd September 2004

2.4.4 Test Equipment Used

The major items of test equipment used for the above tests are identified as “Section 2.4” within the Test Equipment Used table shown in Section 3.1.

2.4.5 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 – 25GHz were then formally measured using Peak and Average Detectors, as appropriate.

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



2.4 SPURIOUS RADIATED EMISSIONS - continued

2.4.5 Test Procedure - continued

The limits for Spurious Emissions Outside the Restricted Bands have been measured and calculated as shown in the table below in accordance with 15.247(c):

Test Mode	Carrier Frequency GHz	Carrier Field Strength dB μ V/m	Limit for Spurious Outside Restricted Band (Carrier F S -20dB) dB μ V/m
Mode 1 (RLAN)	2412	100.8	80.8
Mode 1 (RLAN)	2437	98.3	78.3
Mode 1 (RLAN)	2462	101.8	81.8

The limits for Spurious Emissions Inside the Restricted Bands are in accordance with 15.205(a) & (b), which call up the limits in 15.209 (a)

Frequency Range MHz	Field Strength μ V/m	Quasi Peak Field Strength dB μ V/m	
30-88	100	40.0	
88-216	150	43.5	
216-960	200	46.0	
960-1000	500	54.0	
Above 1000	500	Average Field Strength dB μ V/m	Peak Field Strength dB μ V/m
		54.0	74.0



2.4 SPURIOUS RADIATED EMISSIONS - continued

2.4.6 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).

Measurements were made with the EUT in RLAN Mode (see Section 1.3.3 for details).

EUT Tx on Bottom Channel (2412MHz)

Emission Frequency MHz	Pol H/V	Hgt cm	Azm deg	Field Strength at 3m		Specification Limit	
				dB μ V/m	μ V/m	dB μ V/m	μ V/m
335.4	H	100	000	27.5	23.7	46.0	200.0
335.4	V	153	193	34.2	51.3	46.0	200.0
431.3	V	138	196	29.7	30.5	46.0	200.0
527.2	V	100	176	34.0	50.1	46.0	200.0
623.0	V	100	166	35.9	62.4	46.0	200.0
718.8	H	104	080	25.2	18.2	46.0	200.0

EUT Tx on Middle Channel (2437MHz)

Emission Frequency MHz	Pol H/V	Hgt cm	Azm deg	Field Strength at 3m		Specification Limit	
				dB μ V/m	μ V/m	dB μ V/m	μ V/m
335.5	H	100	000	27.5	23.7	46.0	200.0
335.5	V	145	187	33.9	49.5	46.0	200.0
431.3	V	140	200	29.4	29.5	46.0	200.0
527.1	V	100	175	33.5	47.3	46.0	200.0
622.9	V	100	168	35.3	58.2	46.0	200.0
718.8	H	106	084	25.6	19.1	46.0	200.0



2.4 SPURIOUS RADIATED EMISSIONS - continued

2.3.6 Test Results – continued

30MHz - 1GHz Frequency Range

EUT Tx on Top Channel (2462MHz)

Emission Frequency MHz	Pol H/V	Hgt cm	Azm deg	Field Strength at 3m		Specification Limit	
				dB μ V/m	μ V/m	dB μ V/m	μ V/m
335.3	H	100	000	27.4	23.4	46.0	200.0
335.5	V	137	190	34.4	52.5	46.0	200.0
431.4	V	138	200	30.8	34.7	46.0	200.0
527.0	V	100	179	33.8	49.0	46.0	200.0
623.1	V	100	174	35.8	61.7	46.0	200.0
718.9	H	100	090	25.7	19.3	46.0	200.0

ABBREVIATIONS FOR ABOVE TABLES

H Horizontal Polarisation
Pol Polarisation
deg degree

V Vertical Polarisation
Hgt Height
Azm Azimuth



2.4 SPURIOUS RADIATED EMISSIONS - continued

2.4.6 Test Results - continued

1GHz - 25GHz 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 – 25GHz).

Measurements were made with the EUT in RLAN Mode (see Section 1.3.3 for details).

EUT Tx on Bottom Channel (2412MHz)

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
2.038	H	115	215	57.4	80.8	N/A	N/A
2.368	H	100	128	51.8	74.0	40.0	54.0
4.076	V	106	168	53.1	74.0	50.8	54.0
4.825	V	104	166	61.3	74.0	47.4	54.0

EUT Tx on Middle Channel (2437MHz)

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
2.063	H	118	230	56.5	78.3	N/A	N/A
2.327	H	100	132	51.2	74.0	42.0	54.0
4.126	V	105	168	54.7	74.0	52.0	54.0
4.874	V	106	192	56.6	74.0	42.5	54.0
6.189	H	100	197	50.0	78.3	N/A	N/A

EIRP Results are only taken for frequencies that fall Outside the Restricted Band in accordance 15.247(c.)

Note: The Measurements in the above tables marked N/A are Not Applicable because the frequency does not fall within the Restricted Band (15.205) and hence Average Measurements are not required.



2.4 SPURIOUS RADIATED EMISSIONS - continued

2.4.6 Test Results - continued

1GHz - 25GHz Frequency Range - continued

EUT Tx on Top Channel (2462MHz)

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
2.088	H	141	231	56.7	81.8	N/A	N/A
2.352	H	100	135	53.3	74.0	45.2	54.0
2.374	H	100	126	52.4	74.0	42.3	54.0
2.385	H	100	125	52.7	74.0	41.5	54.0
4.176	H	142	190	53.9	74.0	51.8	54.0
4.923	V	114	118	57.1	74.0	42.5	54.0
6.260	H	100	187	49.4	81.8	N/A	N/A

EIRP Results are only taken for frequencies that fall Outside the Restricted Band in accordance 15.247(c.)

Note: The Measurements in the above tables marked N/A are Not Applicable because the frequency does not fall within the Restricted Band (15.205) and hence Average Measurements are not required.

ABBREVIATIONS FOR ABOVE TABLES

H Horizontal Polarisation
 Pol Polarisation
 deg degree

V Vertical Polarisation
 Hgt Height
 Azm Azimuth



SECTION 2

TEST DETAILS BLUETOOTH MODE

Limited FCC CFR 47: Part 15 C Testing in support of an
Application for Grant of Equipment Authorisation
Of a Symbol 41210000 Hand Held Data Terminal



2.5 MEASUREMENT AT THE BAND EDGE (MARKER DELTA METHOD)

2.5.1 Specification Reference

FCC CFR 47: Part 15 Subpart C, Section 15.205

2.5.2 Equipment Under Test

41210000 Hand Held Data Terminal

2.5.3 Date of Test

18th September 2004

2.5.4 Test Equipment Used

The major items of test equipment used for the above tests are identified as "Section 2.5" within the Test Equipment Used table shown in Section 3.1.

2.1.6 Test Procedure

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



2.5 MEASUREMENT AT THE BAND EDGE (MARKER DELTA METHOD)

2.5.6 Test Results

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 (see Section 1.3.3 for details).

Step 1

Bottom Channel Fundamental Field Strength Measurement.

Peak measurements performed utilising a Resolution Bandwidth and Video Bandwidth of 1MHz. Average measurements 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	V	100	002	95.4	84.5

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 = 49.9dB

Step 3

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

Peak of 45.5dB μ V/m (Limit is 74.0dB μ V/m)

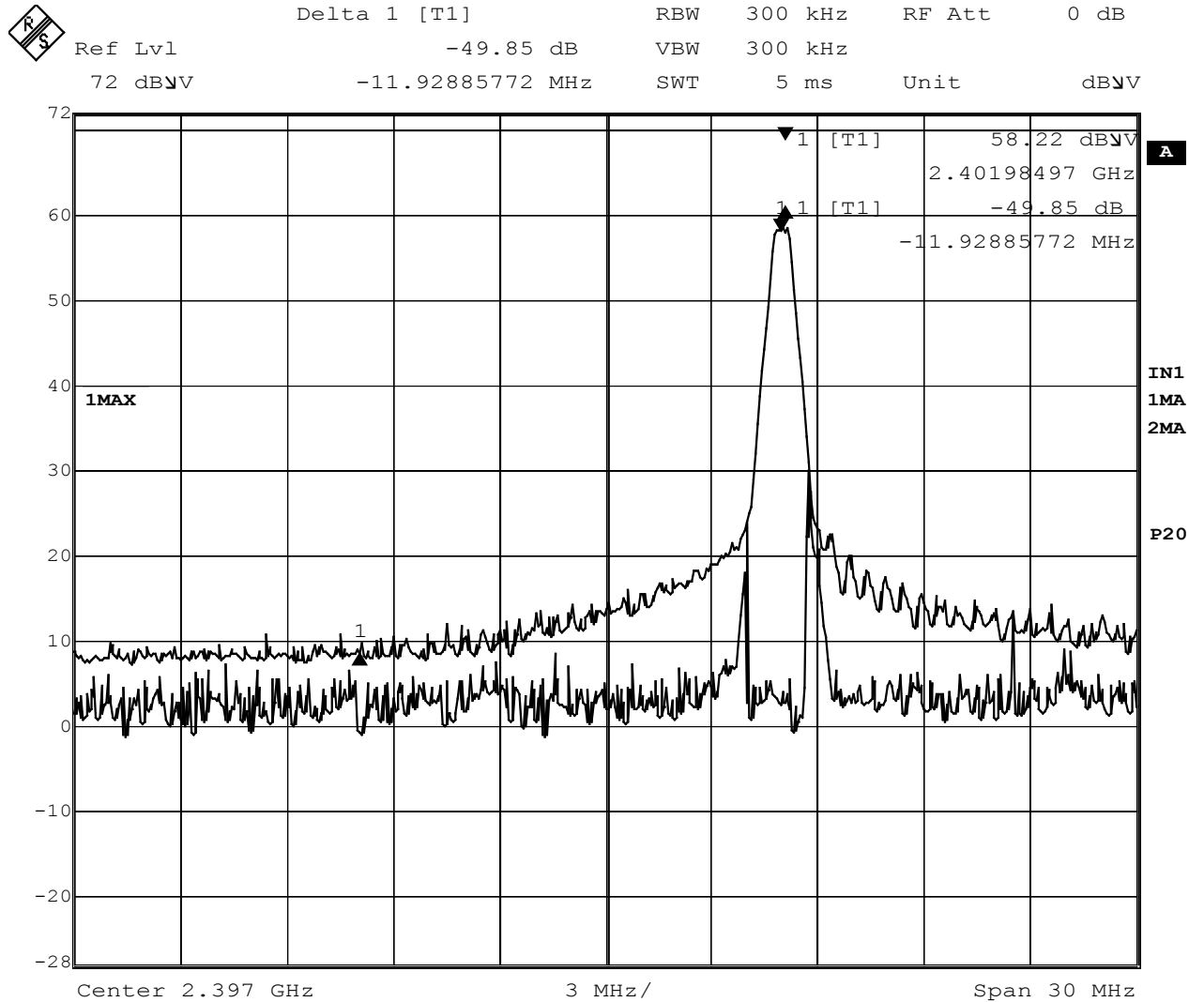
Average of 34.6dB μ V/m (Limit is 54.0dB μ V/m)



2.5 MEASUREMENT AT THE BAND EDGE (MARKER DELTA METHOD) - continued

2.5.6 Test Results - continued

Plot for Bluetooth Bottom Channel 2402MHz



Date: 18.SEP.2004 14:10:48



2.5 MEASUREMENT AT THE BAND EDGE (MARKER DELTA METHOD) - continued

2.5.6 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 (see Section 1.3.3 for details).

Step 1

Top Channel Fundamental Field Strength Measurement.

Peak measurements performed utilising a Resolution Bandwidth and Video Bandwidth of 1MHz.
Average measurements 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	100	000	96.2	83.0

Step 2

Determine Marker delta amplitude between 2480MHz (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 = 39.9dB

Step 3

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

Peak of 56.3dB μ V/m (Limit is 74.0dB μ V/m)

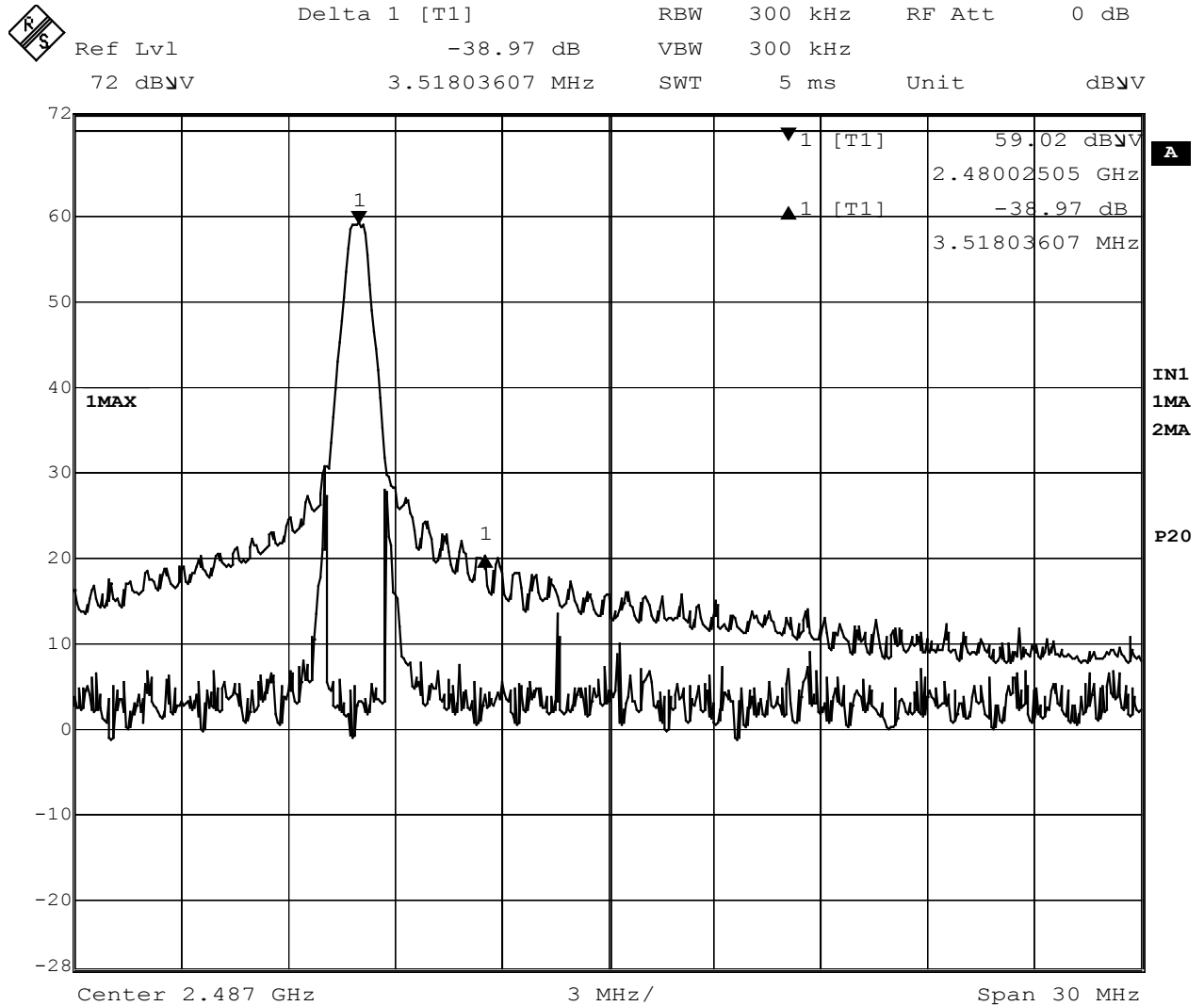
Average of 43.1dB μ V/m (Limit is 54.0dB μ V/m)



2.5 MEASUREMENT AT THE BAND EDGE (MARKER DELTA METHOD) - continued

2.5.6 Test Results - continued

Plot for Bluetooth Top Channel 2480MHz



Date: 18.SEP.2004 14:38:26



2.6 CONDUCTED EMISSIONS ON POWER LINES

2.6.1 Specification Reference

FCC CFR 47: Part 15 Subpart C, Section 15.207

2.6.2 Equipment Under Test

41210000 Hand Held Data Terminal

2.3.4 Date of Test

24th September 2004

2.6.4 Test Equipment Used

The major items of test equipment used for the above tests are identified as “Section 2.6” within the Test Equipment Used table shown in Section 3.1.

2.6.5 Test Procedure

Test performed in accordance with ANSI C63.4.

Conducted Emission Measurements were undertaken within the semi-anechoic chamber. Emissions were measured on the Live and Neutral Lines in turn.

Emissions were formally measured using a Quasi-Peak and Average Detectors, which meet the CISPR requirements. The details of the worst-case emissions for the Live and Neutral Lines are presented in the tables that follow.

The EUT was supplied via the Charger from a 120V, 60Hz supply.



2.6 CONDUCTED EMISSIONS ON POWER LINES - continued

2.6.6 Test Results

The EUT met the Class B requirements of FCC CFR 47: Part 15 Subpart C, Section 15.207 for Conducted Emissions on the Live and Neutral Lines.

Measurements were made with the EUT in RLAN Mode (see Section 1.3.3 for details).

EUT Tx on Bottom Channel (2402MHz) – Live Line

Emission Frequency (MHz)	Average Level (dB μ V)	Quasi-Peak Level (dB μ V)	Average Limit (dB μ V)	Quasi-Peak Limit (dB μ V)
0.1503	25.8	46.6	56.0	66.0
0.1757	37.1	49.2	54.7	64.7
0.2130	33.2	43.7	53.1	63.1
0.2484	33.4	40.0	51.8	61.8
0.2839	27.7	37.4	50.7	60.7
20.5871	37.1	42.3	50.0	60.0

The margin between the specification requirements and all other emissions were 23.3dB or more below the specified Quasi-Peak limit and 37.1dB or more below the Average limit.

EUT Tx on Bottom Channel (2402MHz) – Neutral Line

Emission Frequency (MHz)	Average Level (dB μ V)	Quasi-Peak Level (dB μ V)	Average Limit (dB μ V)	Quasi-Peak Limit (dB μ V)
0.1501	25.4	47.1	56.0	66.0
0.1802	36.7	48.6	54.5	64.5
0.2142	33.5	44.4	53.0	63.0
0.2485	33.7	40.4	51.8	61.8
2.6628	30.3	35.5	46.0	56.0
20.8390	37.2	41.4	50.0	60.0

The margin between the specification requirements and all other emissions were 21.4dB or more below the specified Quasi-Peak limit and 33.7dB or more below the Average limit.



2.6 CONDUCTED EMISSIONS ON POWER LINES - continued

2.6.6 Test Results - continued

EUT Tx on Middle Channel (2441MHz) – Live Line

Emission Frequency (MHz)	Average Level (dB μ V)	Quasi-Peak Level (dB μ V)	Average Limit (dB μ V)	Quasi-Peak Limit (dB μ V)
0.1500	25.4	46.3	56.0	66.0
0.1606	24.4	44.6	55.4	65.4
0.1772	36.1	48.9	54.6	64.6
0.2130	32.7	43.1	53.1	63.1
0.3552	25.7	31.2	48.8	58.8
20.2420	35.5	40.2	50.0	60.0

The margin between the specification requirements and all other emissions were 27.5dB or more below the specified Quasi-Peak limit and 36.1dB or more below the Average limit.

EUT Tx on Middle Channel (2441MHz) – Neutral Line

Emission Frequency (MHz)	Average Level (dB μ V)	Quasi-Peak Level (dB μ V)	Average Limit (dB μ V)	Quasi-Peak Limit (dB μ V)
0.1501	25.4	46.5	56.0	66.0
0.1785	37.1	48.9	54.5	64.5
0.2129	33.1	42.9	53.1	63.1
0.2485	32.3	41.1	51.8	61.8
2.6979	30.9	35.5	46.0	56.0
20.4479	38.6	42.8	50.0	60.0

The margin between the specification requirements and all other emissions were 20.7dB or more below the specified Quasi-Peak limit and 37.1dB or more below the Average limit.



2.6 CONDUCTED EMISSIONS ON POWER LINES - continued

2.6.6 Test Results - continued

EUT Tx on Top Channel (2480MHz) – Live Line

Emission Frequency (MHz)	Average Level (dB μ V)	Quasi-Peak Level (dB μ V)	Average Limit (dB μ V)	Quasi-Peak Limit (dB μ V)
0.1500	25.8	46.3	56.0	66.0
0.1598	24.8	44.5	55.5	65.5
0.1782	35.2	48.4	54.6	64.6
0.2130	32.6	43.9	53.1	63.1
0.2484	31.7	39.7	51.8	61.8
20.2323	38.4	43.0	50.0	60.0

The margin between the specification requirements and all other emissions were 22.1dB or more below the specified Quasi-Peak limit and 24.5dB or more below the Average limit.

EUT Tx on Top Channel (2480MHz) – Neutral Line

Emission Frequency (MHz)	Average Level (dB μ V)	Quasi-Peak Level (dB μ V)	Average Limit (dB μ V)	Quasi-Peak Limit (dB μ V)
0.1500	25.4	46.7	56.0	66.0
0.1782	35.9	48.4	54.6	64.6
0.2130	32.9	43.9	53.1	63.1
0.2841	33.4	36.7	50.7	60.7
2.6275	28.5	32.2	46.0	56.0
20.2395	38.2	42.5	50.0	60.0

The margin between the specification requirements and all other emissions were 24.0dB or more below the specified Quasi-peak limit and 18.4dB or more below the specified Average limit.



2.7 MAXIMUM PEAK OUTPUT POWER (EIRP Method)

2.7.1 Specification Reference

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

2.7.2 Equipment Under Test

41210000 Hand Held Data Terminal

2.5.3 Date of Test

17th September 2004

2.7.4 Test Equipment Used

The major items of test equipment used for the above tests are identified as “Section 2.7” within the Test Equipment Used table shown in Section 3.1.

2.7.5 Test Procedure

Test Performed in accordance with ANSI C63.4.

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, who's input signal level into the antenna was adjusted until the received level matched that of the previously detected emission.



2.7 MAXIMUM PEAK OUTPUT POWER (EIRP Method) - continued

2.7.6 Test Results - continued

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 Bluetooth Mode (see Section 1.3.3 for details).

Frequency (MHz)	Result EIRP (dBm)	Result EIRP (mW)
2402	-0.6	0.87
2441	0.1	1.01
2480	-2.4	0.58
Limit	<+36dBm or <4W	



2.8 SPURIOUS RADIATED EMISSIONS

2.8.1 Specification Reference

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

2.8.2 Equipment Under Test

41210000 Hand Held Data Terminal

2.8.3 Date of Test

20th – 22nd September 2004

2.8.4 Test Equipment Used

The major items of test equipment used for the above tests are identified as “Section 2.8” within the Test Equipment Used table shown in Section 3.1.

2.8.5 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 – 25GHz were then formally measured using Peak and Average Detectors, as appropriate.

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



2.8 SPURIOUS RADIATED EMISSIONS - continued

2.8.5 Test Procedure - continued

The limits for Spurious Emissions Outside the Restricted Bands have been measured and calculated as shown in the table below:

Test Mode	Carrier Frequency GHz	Carrier Field Strength dB μ V/m	Limit for Spurious Outside Restricted Band (Carrier F S -20dB) dB μ V/m
Mode 2 (Bluetooth)	2402	94.4	74.4
Mode 2 (Bluetooth)	2441	97.8	77.8
Mode 2 (Bluetooth)	2480	95.2	75.2

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 625 μ s.

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 $20 \log (5.81/100) = -24.7\text{dB}$



2.8 SPURIOUS RADIATED EMISSIONS - continued

2.8.6 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).

Measurements were made with the EUT in Bluetooth Mode (see Section 1.3.3 for details).

EUT Tx on Bottom Channel (2402MHz)

Emission Frequency MHz	Pol H/V	Hgt cm	Azm deg	Field Strength at 3m		Specification Limit	
				dB μ V/m	μ V/m	dB μ V/m	μ V/m
335.5	H	100	000	28.0	25.1	46.0	200.0
431.6	V	129	195	28.9	27.9	46.0	200.0
528.4	V	100	183	33.9	49.5	46.0	200.0
622.3	H	100	239	26.3	20.7	46.0	200.0
622.6	V	100	177	35.4	58.9	46.0	200.0
719.6	H	100	000	28.0	25.1	46.0	200.0

EUT Tx on Middle Channel (2441MHz)

Emission Frequency MHz	Pol H/V	Hgt cm	Azm deg	Field Strength at 3m		Specification Limit	
				dB μ V/m	μ V/m	dB μ V/m	μ V/m
335.5	H	100	018	28.6	26.9	46.0	200.0
335.9	V	154	194	34.7	54.3	46.0	200.0
431.3	V	125	175	29.6	30.2	46.0	200.0
527.9	V	100	179	34.0	50.1	46.0	200.0
623.0	H	117	246	29.0	28.2	46.0	200.0
623.0	V	100	165	35.4	58.9	46.0	200.0



2.8 SPURIOUS RADIATED EMISSIONS - continued

2.6.7 Test Results – continued

30MHz - 1GHz Frequency Range

EUT Tx on Top Channel (2480MHz)

Emission Frequency	Pol	Hgt	Azm	Field Strength at 3m		Specification Limit	
				MHz	H/V	cm	deg
335.2	H	100	010	29.0	28.2	46.0	200.0
336.0	V	144	200	35.0	56.2	46.0	200.0
431.2	V	130	127	30.1	32.0	46.0	200.0
527.7	V	100	188	34.4	52.5	46.0	200.0
622.7	V	100	170	36.1	63.8	46.0	200.0
622.9	H	120	235	29.6	30.2	46.0	200.0

ABBREVIATIONS FOR ABOVE TABLES

H Horizontal Polarisation
 Pol Polarisation
 deg degree

V Vertical Polarisation
 Hgt Height
 Azm Azimuth



2.8 SPURIOUS RADIATED EMISSIONS - continued

2.8.6 Test Results - continued

1GHz - 25GHz 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 – 25GHz).

Measurements were made with the EUT in Bluetooth Mode (see Section 1.3.3 for details).

EUT Tx on Bottom Channel (2402MHz)

No EUT emissions were detected above the system noise floor, which was at least 25dB below the limit.

EUT Tx on Middle Channel (2441MHz)

No EUT emissions were detected above the system noise floor, which was at least 25dB below the limit.

EUT Tx on Top Channel (2480MHz)

No EUT emissions were detected above the system noise floor, which was at least 25dB below the limit.



SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

Instrument	Manufacturer	Type No	EMC / INV No	Cal. Due
Section 2.1, 2.4, 2.5 & 2.8				
Turntable Controller	HD Gmbh	HD 050	2528	TU
Antenna Mast	Emco	1051-2	2182	TU
Screened Room 5	Siemens	EAC54300	2533	TU
EMI Test Receiver	Rohde & Schwarz	ESIB40	2917	11/02/2005
Antenna	Emco	3115	2397	07/07/2005
Signal Generator	Hewlett Packard	8672A	411	02/03/2005
Digital Barometer	Oregon Scientific	BAA913HG	Room 5	TU
Attenuator	Narda	4768-6	2959	TU
Emi Test Receiver	Rohde & Schwarz	ESIB26	2989	08/04/2005
Low Noise Amplifier	Miteq Corp	AMF-3d-001080-18-13P	2457	TU
Solid State Amplifier	Avantek	AWT-18036	1081	26/06/2005
Signal Amplifier	Avantek	AMT-26177-33	2072	25/06/2005
Drg Horn Ant	Emco	3115	2297	07/07/2005
Signal Generator	Hewlett Packard	8673B	953	10/06/2005
Attenuator Fixed	Narda	4768-3	2962	TU
Attenuator 10dB	Marconi	6534/3	1494	TU
Attenuator Fixed	Marconi	4768-3	2961	TU
Signal Generator	Marconi	2031	1979	30/10/2004
Standard 20dB Gain Horn	Flann	2024-20	1396	TU
Signal Generator	Rohde & Schwarz	SMR 40	2768	18/10/2004
Spectrum Analyser	Hewlett Packard	8542E	2286	18/05/2005
Bilog Antenna	Schaffner	CBL6143	2965	12/09/2006
3GHz High Pass Filter	RLC Electronics	F-100-3000-5-R	4969	10/03/2005
Section 2.2 & 2.6				
Spectrum Monitor	Rohde & Schwarz	EZM	1416	TU
Three Phase LISN	Rohde & Schwarz	ESH2-Z5	1584	02/10/2004
Screened Room 5	Siemens	EAC54300	2533	TU
Test Receiver	Rohde & Schwarz	ESH3	1020	24/09/2005
Transient Limiter	Hewlett Packard	11947A	2243	24/01/2005
Section 2.3 & 2.7				
EMI Test Receiver	ROH	ESIB26	2989	08/04/2005
Signal Generator	HEW	8673B	953	10/06/2005
Attenuator Fixed	NAR	4768-3	2962	TU
Screened Room 5	SIE	EAC54300	2533	TU
Emi Test Receiver	ROH	ESIB26	2989	08/04/2005
Peak Power Ana	HEW	8990A	1670	24/08/2005
Power Sensor	HEW	84812A	1662	24/08/2005
Turntable Controller	HD Gmbh	HD 050	2528	TU
Antenna Mast	Emco	1051-2	2182	TU
Screened Room 5	Siemens	EAC54300	2533	TU
Horn Antenna	Emco	3115	2297	07/07/2005
Antenna	Emco	3115	2397	07/07/2005
Digital Barometer	Oregon Scientific	BAA913HG	Room 5	TU



3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	Frequency / Parameter	MU
Conducted Emissions, LISN	150kHz to 30MHz Amplitude	3.2dB*
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*
Substitution Antenna, Radiated Field	30MHz to 18GHz Amplitude	2.6dB
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Substitution Antenna, Radiated Field	30MHz to 18GHz Amplitude	2.6dB

Worst case error for both Time and Frequency measurement 12 parts in 10^6 .

* In accordance with CISPR 16-4



SECTION 4

EUT PHOTOGRAPH



EUT PHOTOGRAPH



Front View



SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



5.1 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