



TTI-P-G 166/98-20

Accredited Bluetooth™ Test Facility (BQTF)

**Addendum to no.: 2_2592-4-D/01
FCC Part 15.247 / CANADA RSS-210**

**802.11b Mini PCI Card + v.90/92 WLAN
FCC ID: PUBWCM1001**

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1 General Information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 1.5. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.

1.2 Testing Laboratory

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Accredited testing laboratory

DAR-registration number : TTI-P-G 166/98-20

Accredited Bluetooth™ Test Facility (BQTF)

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1.3 Details of Applicant

Name : Philips Components
Street : 620A Lorong 1, TP3 Level 5
City : Toa Payoh 319762
Country : Singapore
Telephone : +65 350 2766
Telefax : +65 252 6201
Contact : Mr M. Guruprasad
Telephone : +65 350 2766

1.4 Application Details

Date of receipt of application : 2002-09-18
Date of receipt of test item : 2002-09-18
Date of test : 2002-09-18
Revised :

1.5 Test Item

Type of equipment : DSSS RLAN
Type designation : 802.11b Mini PCI Card + v. 90/92 WLAN:PH10754 or WLM1100M
Manufacturer : See applicant
Street :
City :
Country :

Additional information :

Frequency : 2412 – 2472 MHz
Type of modulation : 22M0P7D (DSSS)
Number of channels : 13
Antenna : Lambda/4 antenna, see discription
Power supply : 3,3 V DC from PC
Peak output power : Conducted : 19.46 dBm / 88.31 mW
Temperature range : -10°C - +60°C
FCC ID : PUBWCM1001

Model name:

Model PH10754 and WLM1100M are identical except the model name.
Model PH10754 is designated with a modem part.

Antenna: type no: 3950292

The testfixture antenna is a groundplane antenna made of a semi-rigid coax and with a impedance of 50Ohm. The antenna connector type is UFL

1.6 Test Specifications: FCC Part 15 §15.247 CANADA RSS-210

2 Technical test

2.1 Summary of test results

This addendum was made to show the band edge compliance of the sample.

The radiated measurements were performed vertical and horizontal over the whole frequency range. We start at 1 m high with vertical receiving antenna and rotate the dish continuously. During rotation we use the antenna lift system to vary the high from 1 to 4 m. So we find maximum radiation output. At this points we do manual re-measurements. After this we do the same measurements in horizontal position of the receiving antenna. This (horizontal and vertical) is made for all the three planes of the test sample. We use the maximum received results.

The detector function and selection of bandwidth are according ANSI C63.2-1996 item 8.2.1 and ANSI C63.4-1992 Item 4.2.

Antennas are conform with ANSI C63.2-1996 item 15.

150 kHz - 30 MHz: Quasi Peak measurement, 9kHz Bandwidth, passive loop antenna.

30 MHz - 200 MHz: Quasi Peak measurement, 120KHz Bandwidth, biconical antenna

200MHz - 1GHz: Quasi Peak measurement, 120KHz Bandwidth, log periodic antenna

1GHz: Average, RBW 1MHz, VBW 10 MHz, waveguide horn

All measurement settings are according to FCC 15.35, 15.205, 15.209, 15.247 and the „Measurement guidelines for DSSS systems“.

The product fullfills also the requirements for CANACA RSS-210

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

Final verdict : PASS

Technical responsibility for area of testing :

2002-09-18 RSC 8414 Ames H.



Date

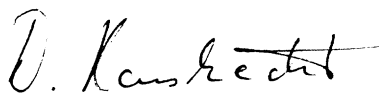
Section

Name

Signature

Technical responsibility for area of testing :

2002-09-18 RSC8412 Hausknecht D.



Date

Section

Name

Signature

2.2 Testreport

TEST REPORT

Addendum to no. : 2_2592-4-D/01

TEST REPORT REFERENCE

LIST OF MEASUREMENTS

Paragraph	PARAMETER TO BE MEASURED	PAGE
	Transmitter parameters	
§ 15.247 (c)	Band edge compliance	7
	Test equipment listing	10
	Photographs of the equipment	12

Radiated field strength**SUBCLAUSE § 15.247**

The field strength was measured with an EMI measuring receiver and 1 MHz RBW / VBW for peak and with 1MHz RBW / 10Hz VBW for average at a distance of 3m.

As the first plot up to 2 MHz within the restricted band showed some spurs near the right border we made an additional plot with larger span and 300 kHz RBW(depending on the analyzer)

The correction factor is the summation of path loss, cable loss, antenna factor and amplifier gain.

The value at 2472 MHz is +15.2 dB.

high channel 2472 MHz	setup	measured value (3m)	correction factor (3m)	calculated value (3m)
Peak value	1 MHz RBW 1 MHz VBW	97.4 dB μ V/m	15.2 dB	112.6 dB μ V/m
Average value	1 MHz RBW 10 Hz VBW	90.2 dB μ V/m	15.2 dB	105.4 dB μ V/m
Delta value	Peak 100 kHz RBW/VBW	55.4 dB	-	-
Delta value	Peak 300 kHz RBW/VBW	53.5 dB	-	-
Value at band edge 100 kHz RBW	limit 54 dB μ V/m			50.0 dB μ V/m
Value at band edge 300 kHz RBW	limit 54 dB μ V/m			51.9 dB μ V/m

The product complies with the limit of the restricted bands.

Delta marker plots see next page

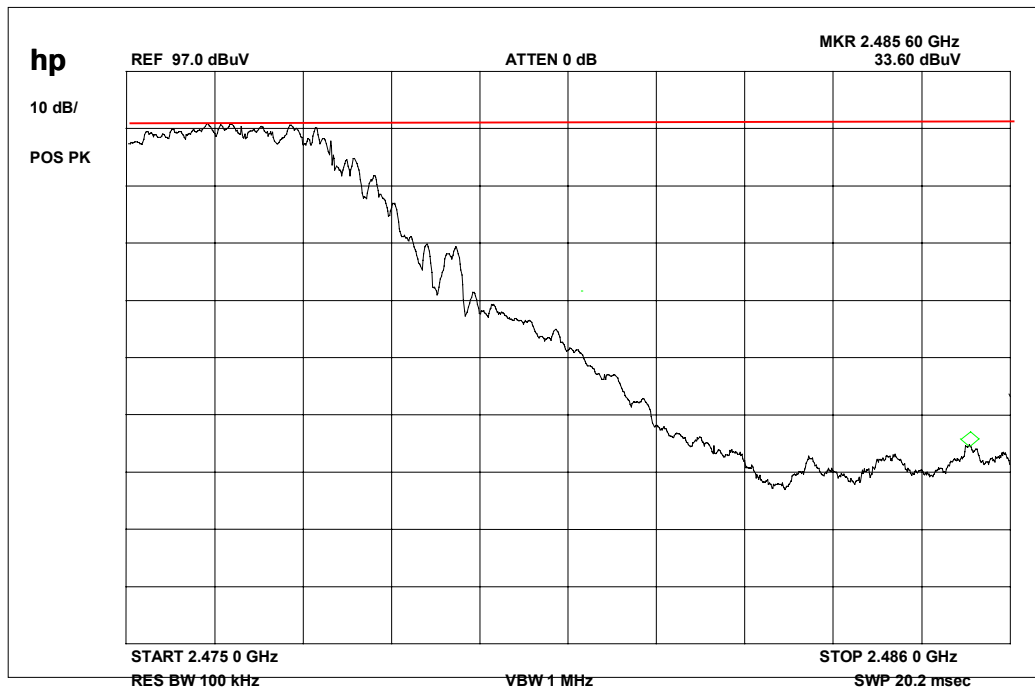
Radiated field strength

SUBCLAUSE § 15.247

Plot of radiated band edge behavior.

100 kHz RBW

red line is at 89 dB μ V/m, marker at 33.6 dB μ V/m, delta dB is 55.4 dB



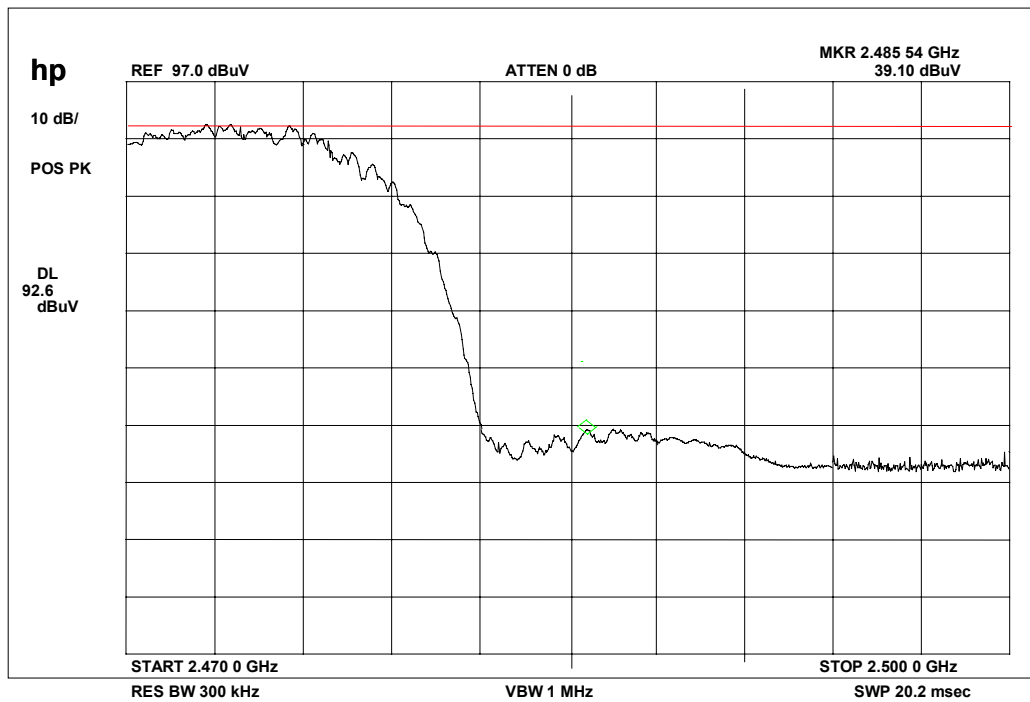
The range is from middle carrier highest frequency up to 2Mhz into restricted band.

Span is 11 MHz, so we choose a RBW of 1% span, here 100 kHz.

There are some spurious at the right border. So we made an additional plot with bigger span to see the next behavior.

300 kHz RBW

red line is at 92.6 dB μ V/m, marker at 39.1 dB μ V/m, delta dB is 53.5 dB



On this plot we can see that there are no higher spurious in the restricted band as we saw with the 100 kHz RBW.

The delta marker shows nearly the same value as with 100 kHz RBW.

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
01	Spectrum Analyzer	8566 A	Hewlett-Packard	1925A00257
02	Analyzer Display	8566 A	Hewlett-Packard	1925A00860
03	Oscilloscope	7633	Tektronix	230054
04	Radio Analyzer	CMTA 54	Rohde & Schwarz	894 043/010
05	System Power Supply	6038 A	Hewlett-Packard	2848A07027
06	Signal Generator	8111 A	Hewlett-Packard	2215G00867
07	Signal Generator	8662 A	Hewlett-Packard	2224A01012
08	Funktionsgenerator	AFGU	Rohde & Schwarz	862 480/032
09	Regeltrenntrafo	MPL	Erfi	91350
10	Netznachbildung	NNLA 8120	Schwarzbeck	8120331
11	Relais-Matrix	PSU	Rohde & Schwarz	893 285/020
12	Power-Meter	436 A	Hewlett-Packard	2101A12378
13	Power-Sensor	8484 A	Hewlett-Packard	2237A10156
14	Power-Sensor	8482 A	Hewlett-Packard	2237A00616
15	Modulationsmeter	9008	Racal-Dana	2647
16	Frequenzzähler	5340 A	Hewlett-Packard	1532A03899
17	Absorber Schirmkabine	---	MWB	87400/002
18	Spectrum Analyzer	85660 B	Hewlett-Packard	2747A05306
19	Analyzer Display	85662 A	Hewlett-Packard	2816A16541
20	Quasi Peak Adapter	85650 A	Hewlett-Packard	2811A01131
21	RF-Preselector	85685 A	Hewlett-Packard	2833A00768
22	Biconical Antenne	3104	Emco	3758
23	Log. Per. Antenne	3146	Emco	2130
24	Double Ridge Horn	3115	Emco	3088
25	EMI-Testreceiver	ESAI	Rohde & Schwarz	863 180/013
26	EMI-Analyzer-Display	ESAI-D	Rohde & Schwarz	862 771/008
27	Biconical Antenne	HK 116	Rohde & Schwarz	888 945/013
28	Log. Per. Antenne	HL 223	Rohde & Schwarz	825 584/002
29	Relais-Switch-Unit	RSU	Rohde & Schwarz	375 339/002
30	Highpass	HM985955	FSY Microwave	001
31	Amplifier	P42-GA29	Tron-Tech	B 23602
32	Absorber Schirmkabine		Frankonia	
33	Steuerrechner	PSM 7	Rohde & Schwarz	834 621/004
34	EMI Test Reciever	ESMI	Rohde & Schwarz	827 063/010
35	EMI Test Receiver	Display	Rohde & Schwarz	829 808/010

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

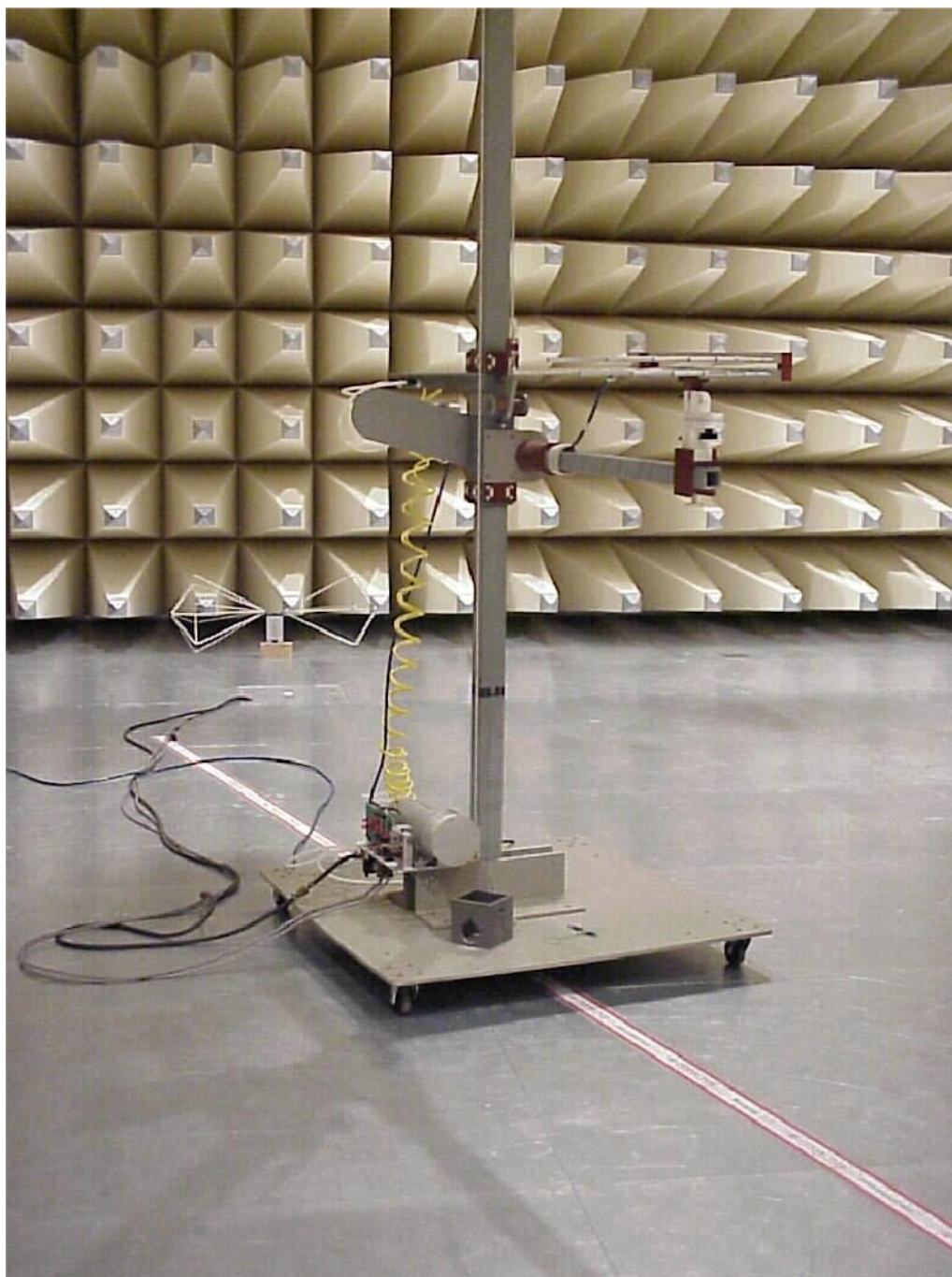
To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
36	Controler	HD 100	Deisel	100/322/93
37	Relais Matrix	PSN	Rohde & Schwarz	829 065/003
38	Control Unit	GB 016 A2	Rohde & Schwarz	344 122/008
39	Relais Switch Unit	RSU	Rohde & Schwarz	316 790/001
40	Power Supply	6032A	Hewlett Packard	2846A04063
41	Spektrum Monitor	EZM	Rohde & Schwarz	883 720/006
42	Meßempfänger	ESH 3	Rohde & Schwarz	890 174/002
43	Meßempfänger	ESVP	Rohde & Schwarz	891 752/005
44	Biconi Ant. 20-300MHz	HK 116	Rohde & Schwarz	833 162/011
45	Logper Ant. 0.3-1 GHz	HL 223	Rohde & Schwarz	832 914/010
46	Amplifier 0.1-4 GHz	AFS4	Miteq Inc.	206461
47	Logper Ant. 1-18 GHz	HL 024 A2	Rohde & Schwarz	342 662/002
48	Polarisationsnetzwerk	HL 024 Z1	Rohde & Schwarz	341 570/002
49	Double Ridge G Horn Antenne 1-26.5 GHz	3115	EMCO	9107-3696
50	Microw. Sys. Amplifier 0.5- 26.5 GHz	8317A	Hewlett Packard	3123A00105
51	Audio Analyzer	UPD	Rohde & Schwarz	1030.7500.04
52	Steuerrechner	PSM 7	Rohde & Schwarz	883 086/026
53	DC V-Netzwerk	ESH3-Z6	Rohde & Schwarz	861 406/005
54	DC V-Netzwerk	ESH3-Z6	Rohde & Schwarz	893 689/012
55	AC 2 Phasen V-Netzwerk	ESH3-Z5	Rohde & Schwarz	861 189/014
56	AC 2 Phasen V-Netzwerk	ESH3-Z5	Rohde & Schwarz	894 981/019
57	AC-3 Phasen V-Netzwerk	ESH2-Z5	Rohde & Schwarz	882 394/007
58	Stromversorgung	6032A	Rohde & Schwarz	2933A05441
59	HF-Test Empfänger	ESVP.52	Rohde & Schwarz	881 487/021
60	Spectrum Monitor	EZM	Rohde & Schwarz	883 086/026
61	HF-Test Empfänger	ESH3	Rohde & Schwarz	881 515/002
62	Relais Matrix	PSU	Rohde & Schwarz	882 943/029
63	Relais Matrix	PSU	Rohde & Schwarz	828 628/007
64	Spectrum Analyzer	FSIQ 26	Rohde & Schwarz	119.6001.27
67				

Test site

RADIATED EMISSIONS

Picture 1:



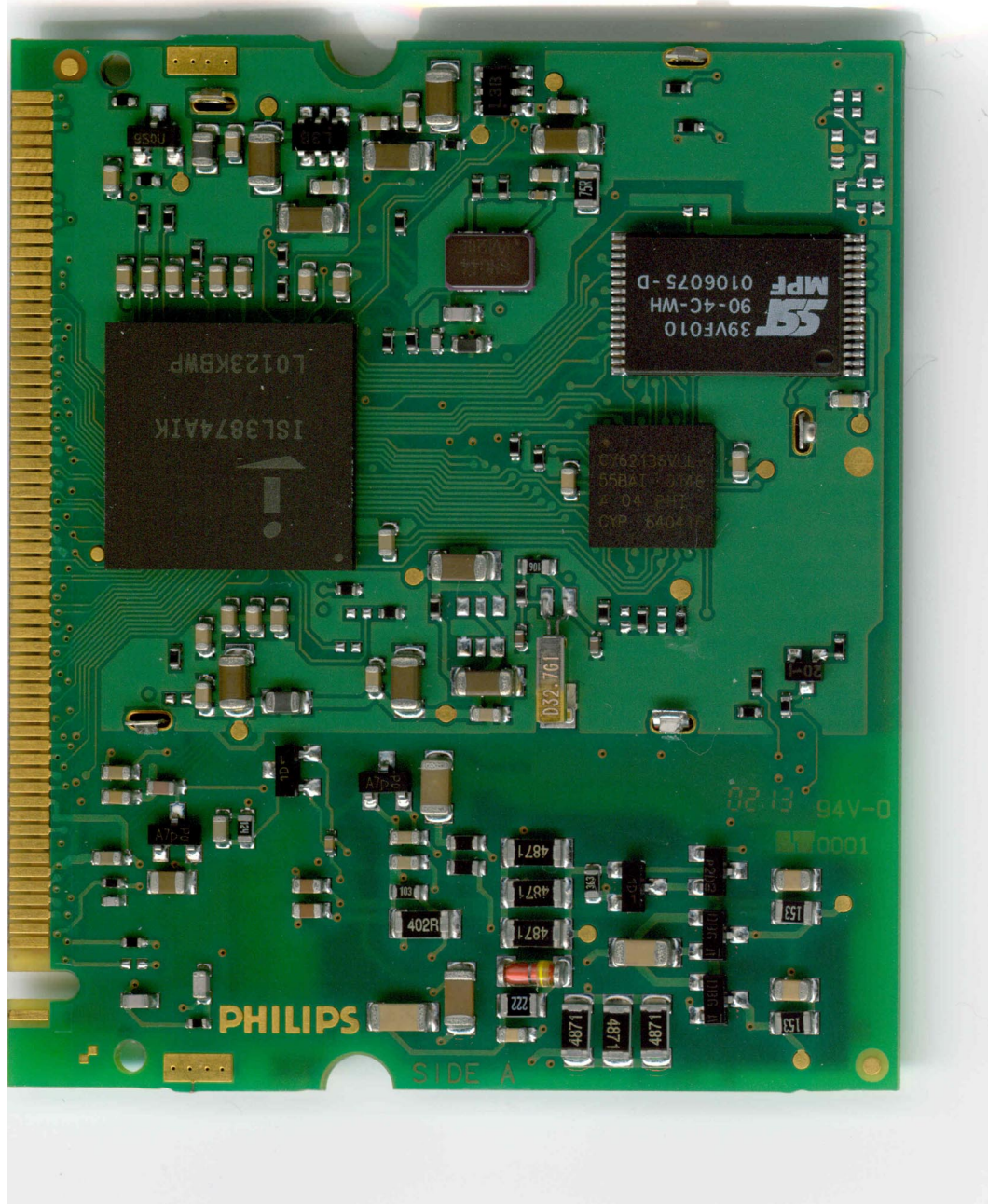
Photographs of the equipment

PH10754

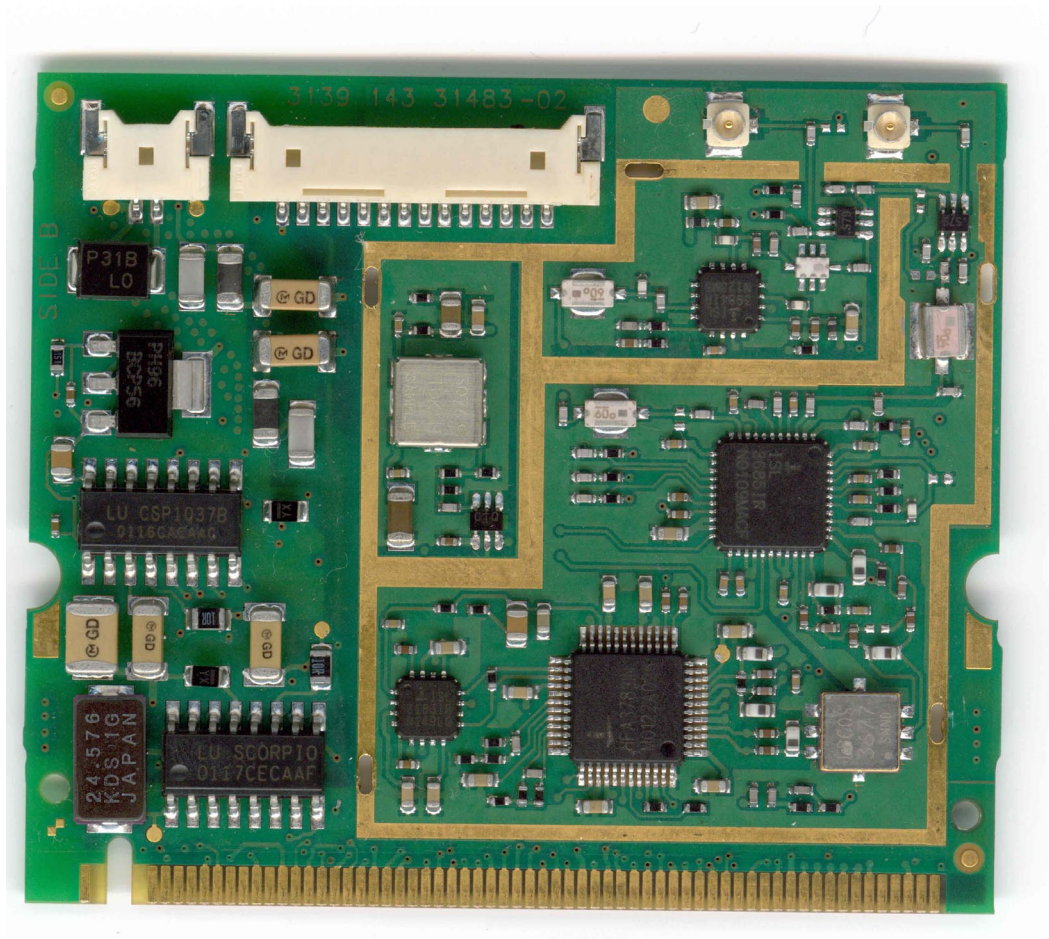


Photographs of the equipment

PH10754

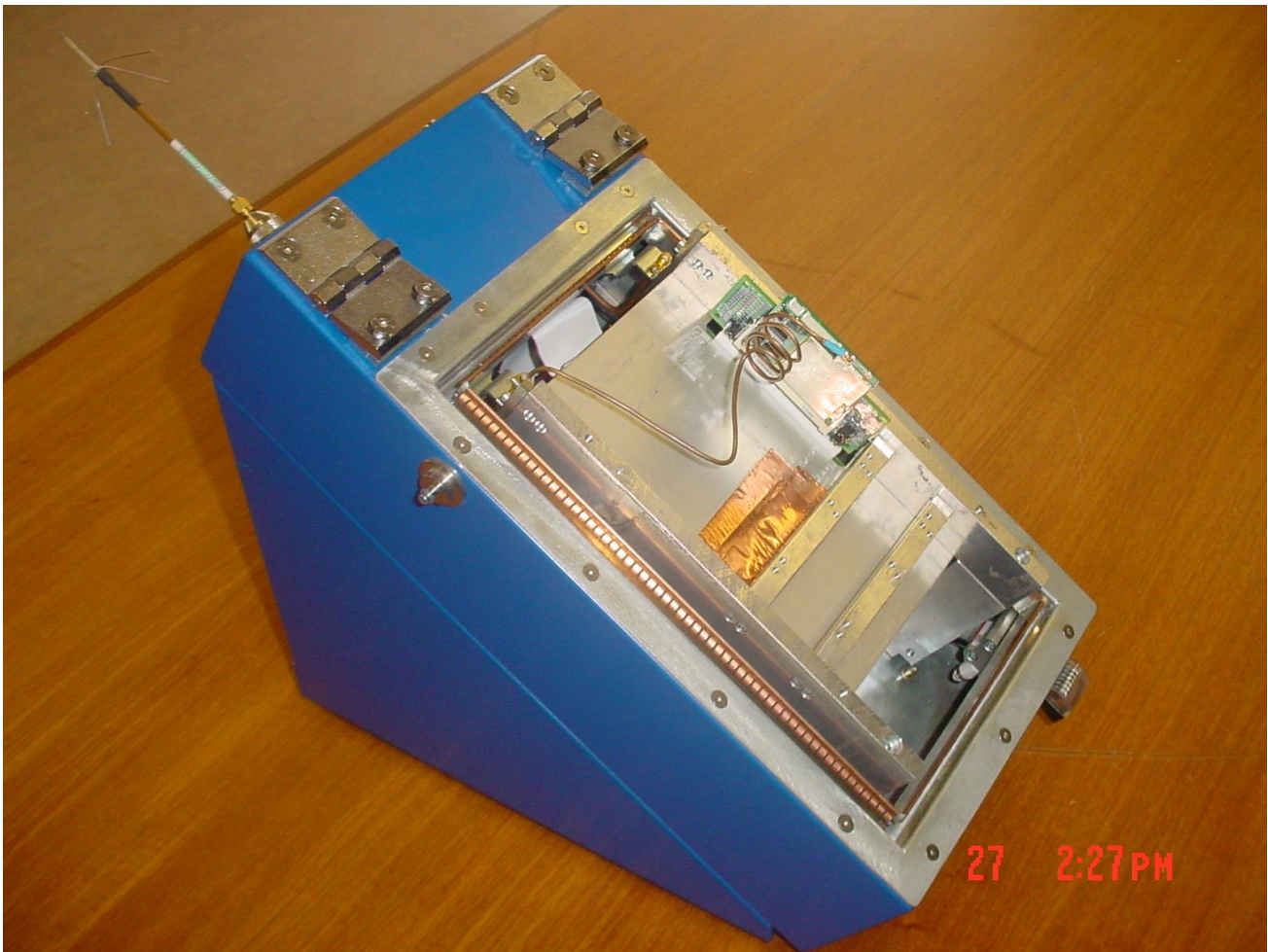


Photographs of the equipment PH10754



Photographs of the equipment

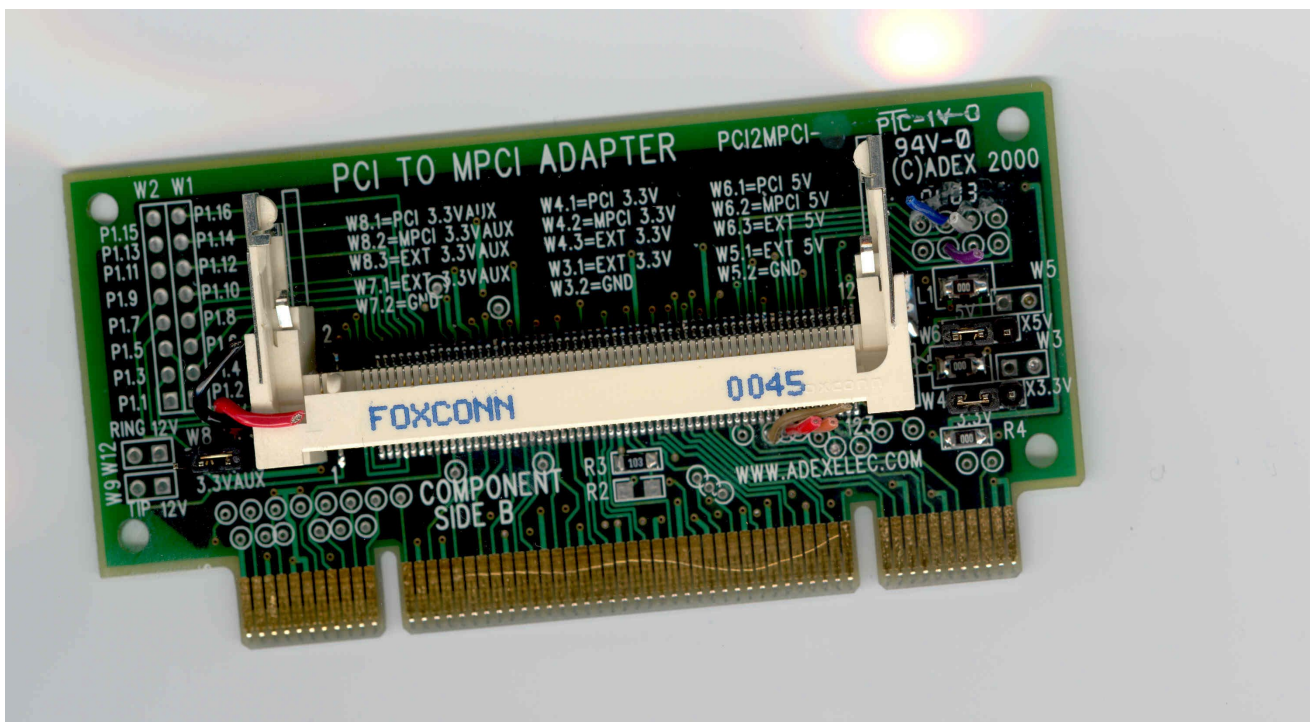
Test fixture



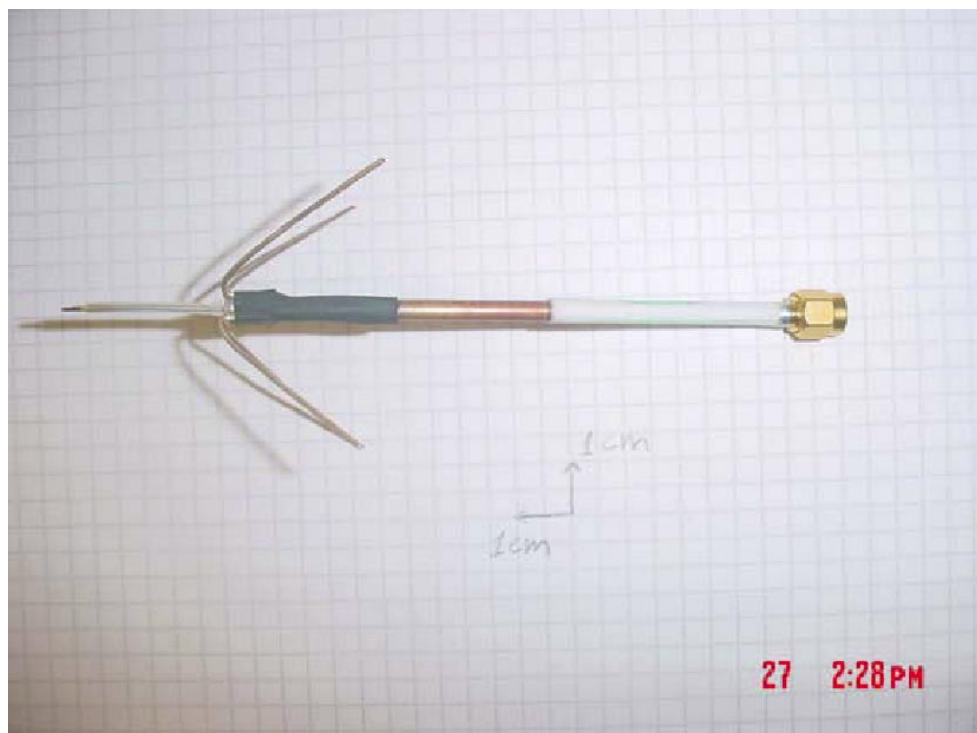
Photograph shows the test fixture with the plugged mini PCI Card.

Photographs of the equipment

Photograph shows the used PCI / mini PCI adapter



Photographs of the equipment



The photographs shows the used antenna for the radiated measurements .