

FCC Part 24 (E) Test Report

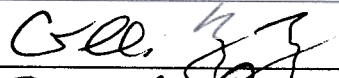
Test performed on the
PCS Base Station
Model: MWIBS-1900
FCC ID: LDKMWIBS1900

for
Cisco Systems Inc.

Test Report: 2037661a
Date of Report: 02/18/01



NVLAP Laboratory Code 200201-0
Accredited for testing to FCC

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Review Date: 02/28/01

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Cisco Systems Inc. Model: MWIBS-1900
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1 JOB DESCRIPTION

1.1 Client Information

The EUT has been tested at the request of

Company: Cisco Systems Inc.

Name of contact: Dong-Chan Park

Telephone: 408-525-6852

Fax: 408-525-4841

1.2 Equipment under test (EUT)

Equipment type: Base Station Radio
Equipment class: Licensed Transmitter
Model number(s): MWIBS-1900
FCC ID:
Manufacturer: SAME as above.
Use of Product : Mobile communications
Production is planned: ☒ Yes, ☐ No

Technical Specifications:

Type of Emission	CDMA
RF Output Power	Maximum Peak Envelope Power: 12.2 dBm Maximum Average Power: 7.5 dBm
Means for variation of operating power	Software controlled
The dc voltage applied to and current into the several elements of the final RF amplifying device	+5 V
Frequency Range	1930 to 1950 MHz
Modulation	QPSK
Emission Designator	
Max. number of Channels	14
Antenna(s) (type, gain)	7.5 dBi, 3 dBi
Detachable antenna ?	Yes
External input	Data
Frequency Tolerance	± 0.05 ppm

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EUT receive date: 01/15/01
EUT received condition: Good condition prototype
Test start date: 01/20/01
Test end date: 02/17/01

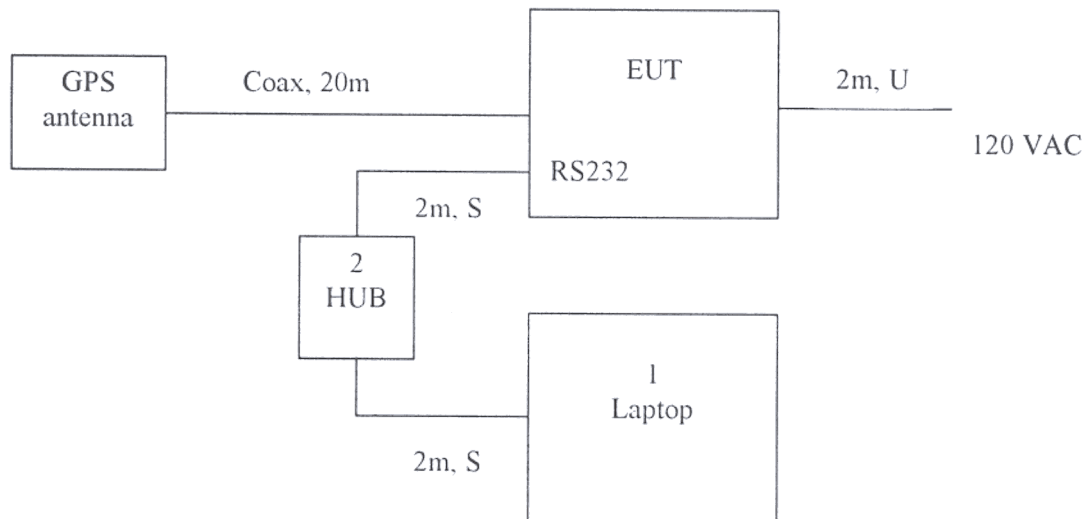
1.3 Test plan reference

FCC Part 2.1033, FCC Part 24 (E)

1.4 System test configuration

1.4.1 System block diagram & Support equipment

The diagram shown below details the placement of the equipment under test on the turntable.



S:	Shielded	U:	Unshielded	F:	With Ferrite Core
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Support equipment					
Item	Equipment	Manufacturer	Model #	S/N #	FCC ID
1	Laptop	Sony	PCG-9212	283107313300801	AK8JPN-35060-M5-E
2	Ethernet HUB	Bay Network	EN106TP	ENT6B0A082923	N/A

Justification

The system was configured for testing in a typical manner in accordance with ANSI C63.4 standard.

Mode(s) of operation

The EUT was powered from 120 VAC. During tests, EUT was operating in transmitting/receiving mode at 3 channels:

1931.25 MHz (Ch. 25),
1940.00 MHz (Ch. 200),
1948.75 MHz. (Ch. 375)

1.5 Modifications required for compliance

No modifications were implemented by Intertek Testing Services.

2 TEST SUMMARY

FCC RULE	DESCRIPTION OF TEST	RESULT	PAGE
Transmitter Section			
2.1046 24.232(b)	RF Power Output	12.2 dBm (Peak); 7.5 dBm (Average)	7
	Equivalent Isotropic Radiated Power (EIRP)	19.7 dBm (Peak), maximum 16 dBm (Average), maximum	
2.1047	Modulation Characteristics	Not Applicable	-
2.1051 24.238	Out-of-band emissions at antenna terminal	Pass	9
2.1053 24.238	Radiated Spurious Emission Attenuation	Pass	12
2.1055 24.235	Frequency Stability	Pass	18
2.1091	Radiated Exposure	Pass	20
Digital Section			
15.109	Radiated Emissions	Pass	12
15.107	Line Conducted Emissions	Pass	19

3 RADIATED POWER

3.1 Test Description

Parameter:	FCC § 2.1046	
Requirement:	FCC § 24.232(a)	
(EIRP):	< 1640 Watts peak	

3.2 Test Procedure

The spectrum analyzer was connected to the antenna terminal of the EUT through a cable having 1.0 dB insertion loss, which was included as OFFSET. The Average output power was set to -8.5 dBm measured by a spectrum analyzer with 30 kHz resolution and 300 Hz video bandwidth. This corresponds to 7.5 dBm of average power. The peak output power then was measured with a spectrum analyzer with the resolution bandwidth of 10 MHz (which is 8 times wider than the bandwidth of the signal) and the video bandwidth of 7 MHz. A peak power meter was also used to verify that the Spectrum Analyzer measured a peak power.

The Equivalent Isotropic Radiated Power (EIRP in dBm) was calculated using equation:

$$\text{EIRP} = P + G$$

Where P is the Output Power (in dBm), G is an antenna Gain (in dBi)

3.3 Test Results

Frequency, MHz	Peak Output Power, dBm	Antenna Gain, dBi	Peak EIRP, dBm	Peak EIRP, mWatt
1931.25	12.2	7.5	19.7	93.3
1940.00	12.2	7.5	19.7	93.3
1948.75	11.1	7.5	18.6	72.4

See plots # 3.1, 3.2, 3.3 in Exhibit 1 for the peak output power.

See also plots # 3.4, 3.5, 3.6 in Exhibit 1 performed with 30 kHz resolution, 300 Hz video bandwidth. The average power equals the readings on the plots plus 16 dB.

3.4 Test Instrumentation

Tektronix 2784 Spectrum Analyzer
HP 8900D Peak Power Meter
HP 7470A Plotter

4 MODULATION CHARACTERISTICS

4.1 Test Description

Parameter:	FCC § 2.1047
Requirement:	Not Applicable

5 OUT-OF-BAND EMISSION AT ANTENNA TERMINAL

5.1 Test description

Parameter:	FCC §2.1051
Requirement:	FCC § 238
Emission Attenuation:	At least $43 + 10\log(P \text{ in Watts})$ dB below the transmitter Power on any frequency outside a licensee's frequency block.

5.2 Test Procedure

The RF output was connected to the input of the spectrum analyzer through sufficient attenuation. For measurements below 1 GHz, the resolution and video bandwidths of the spectrum analyzer were set to 100 kHz. For each of three fundamental frequencies, the output power (peak reading) was measured and plotted. in the frequency range from 30 MHz to 1 GHz.

For measurements above 1 GHz, the resolution bandwidth of the spectrum analyzer was set to 1 MHz and the video bandwidth to 7 MHz. For each of three fundamental frequencies, the output power (average reading) was measured and plotted. in the frequency range from 1 GHz to 20 GHz.

For Low Channel (1931.25 MHz fundamental), the resolution bandwidth of 30 kHz was used for measurement in the frequency range from 1929 MHz to 1930 MHz.

5.3 Test Results

See Exhibit for the out-of-band antenna conducted emission plots:

Plot Number	Description
5.1.a	Low Channel, 30 - 1000 MHz, 100 kHz resolution
5.2.a	Low Channel, 1000 - 1929 MHz, 1 MHz resolution
5.3.a	Low Channel, 1929 - 1930 MHz, 30 kHz resolution
5.4.a	Low Channel, 1930 - 1990 MHz, 30 kHz resolution
5.5.a	Low Channel, 1930 - 1990 MHz, 1 MHz resolution
5.6.a	Low Channel, 1990- 10000 MHz, 1 MHz resolution
5.7.a	Low Channel, 10 -20 GHz, 1 MHz resolution