Test Report:	1W03937.1
Applicant:	SmartSight Networks 1800 Berlier, Suite 440 Laval, Quebec H7L 4S4
Equipment Under Test: (EUT)	SmartSight 1000
In Accordance With:	**FCC Part 15, Subpart C** Direct Sequence Transmitters 2400-2483.5MHz
Tested By:	Nemko Canada Inc. 3325 River Road, R.R. 5 Ottawa, Ontario K1V 1H2
Authorized By:	
	R. Grant, Wireless Group Manager
Date:	
Total Number of Pages:	36

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Section 1. Summary Of Test Results

General

All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15, Subpart C, Paragraph 15.247 for Direct Sequence Spread Spectrum devices.

☒	New Submission	☒	Production Unit
☐	Class II Permissive Change	☐	Pre-Production Unit
D S S	Equipment Code	☐	Family Listing

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.
See " Summary of Test Data".

NVLAP LAB CODE: 100351-0

TESTED BY: _____ DATE: _____
Glen Westwell, Wireless Technologist

TESTED BY: _____ DATE: _____
Wayne Clarke, Wireless Technologist

Summary Of Test Data

Name Of Test	Para. No.	Result
Powerline Conducted Emissions	15.207 (a)	Complies
Occupied Bandwidth	15.247 (a)(2)	Complies
Peak Power Output	15.247 (b)	Complies
Spurious Emissions (Antenna Conducted)	15.247 (c)	Complies
Spurious Emissions (Radiated)	15.247 (c)	Complies
Transmitter Power Density	15.247 (d)	Complies
Processing Gain	15.247 (e)	Complies

Test Conditions:

Indoor Temperature: 22 °C
Humidity: 34 %

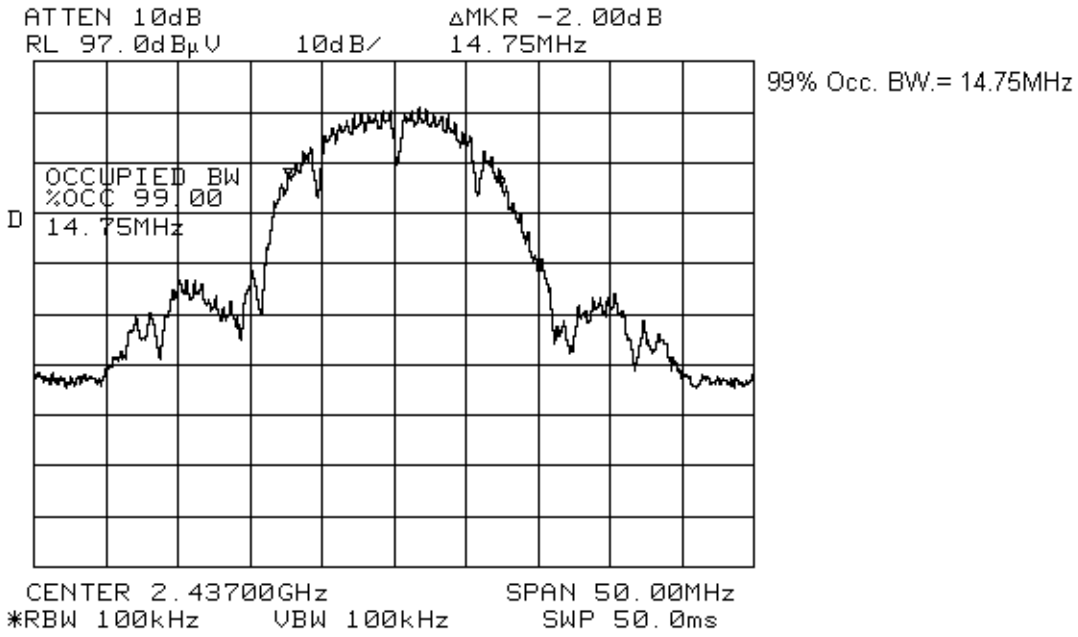
Outdoor Temperature: 25 °C
Humidity: 32 %

Section 2. General Equipment Specification

Manufacturer:	SmartSight Networks
Model No.:	SmartSight 1000
Serial No.:	None
Date Received In Laboratory:	June 22, 2001
Nemko Identification No.:	Item #1

Transmitter

Power Input:	120 VAC
Frequency Range:	2412 to 2462MHz
Tunable Bands:	One
6 dB Bandwidth:	14.8MHz
Type of Modulation	DQPSK
Data Rate:	2 Mbps
Channel Spacing:	5MHz
Emissions Designator:	14M8G1F
Output Impedance:	50ohm
RF Power Output (Rated):	+14dBm ±1dB
Power Output Adjustment Capability:	None


ATTEN 10dB
RL 97.0dBµV
10dB/
ΔMKR -2.00dB
14.75MHz
99% Occ. BW.= 14.75MHz
OCCUPIED BW
%OCC 99.00
14.75MHz
D
CENTER 2.43700GHz
SPAN 50.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms

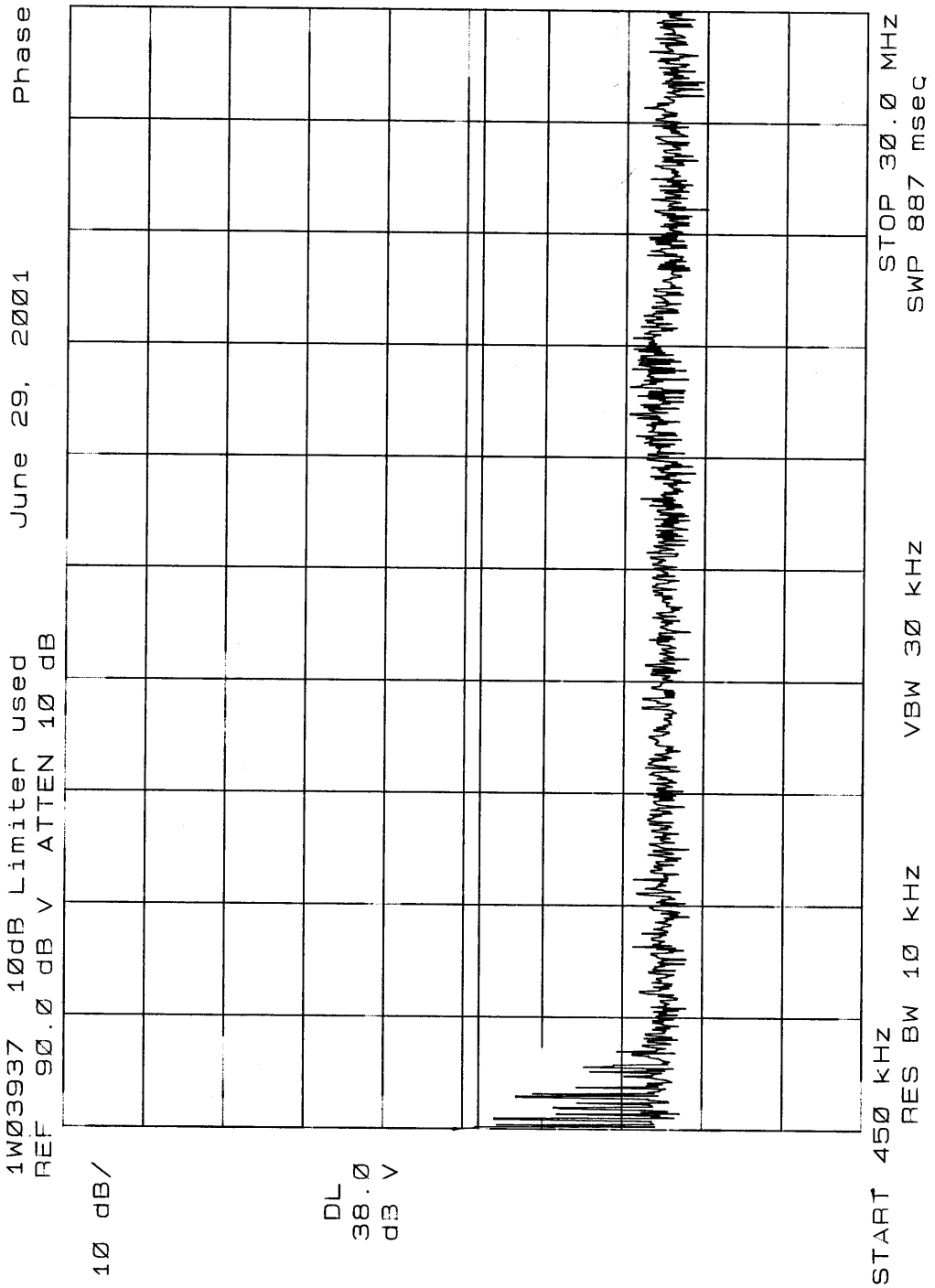
Section 3. Powerline Conducted Emissions

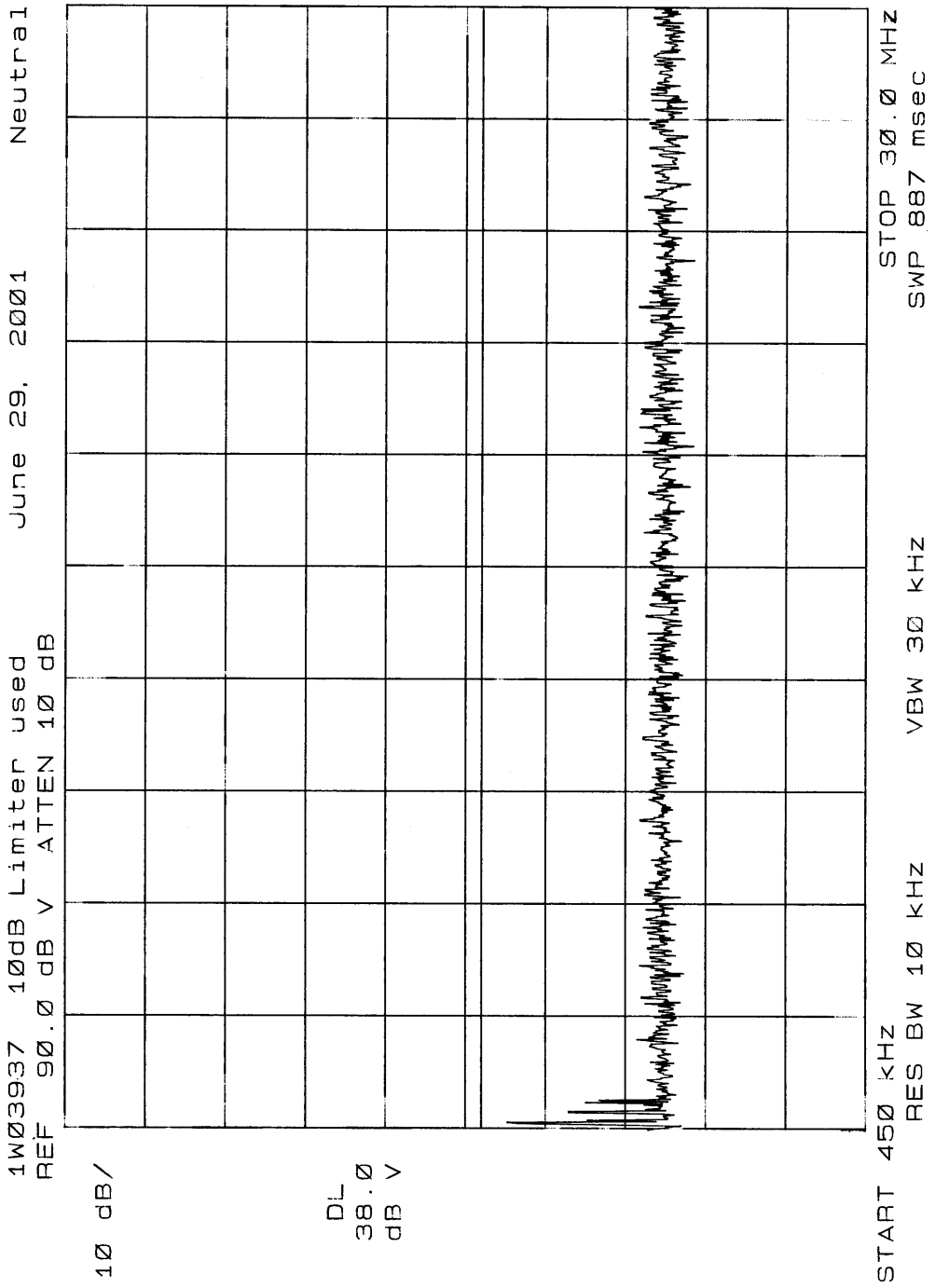
Para. No.: 15.207(a)

Test Performed By: Wayne Clarke	**Date of Test:** June 29, 2001

Test Results: Complies. See attached graph.

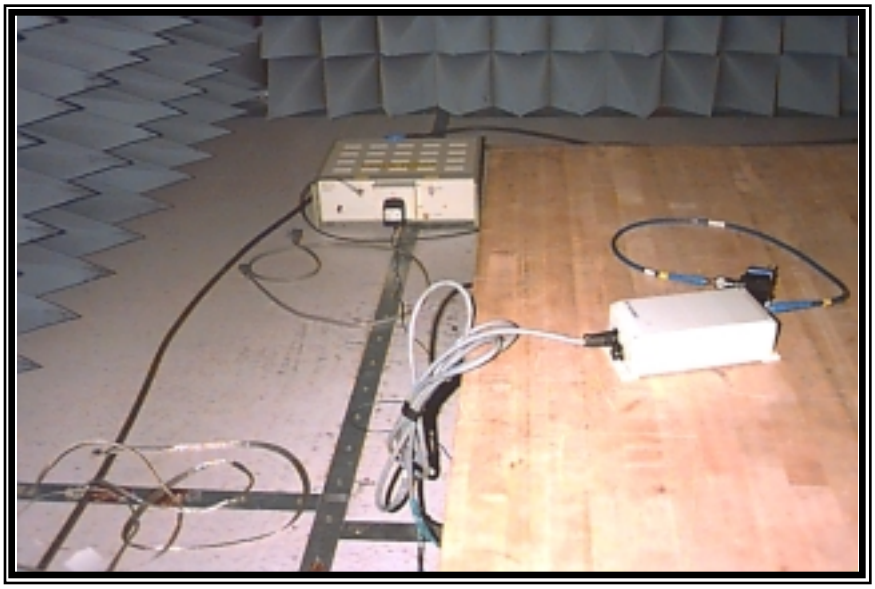
Measurement Data: See attached graph.


1W03937 10dB Limiter used June 29, 2001 Phase
REF 90.0 dB V ATTEN 10 dB
10 dB/
DL
38.0
dB V
START 450 kHz
RES BW 10 kHz
VBW 30 kHz
STOP 30.0 MHz
SWP 887 msec

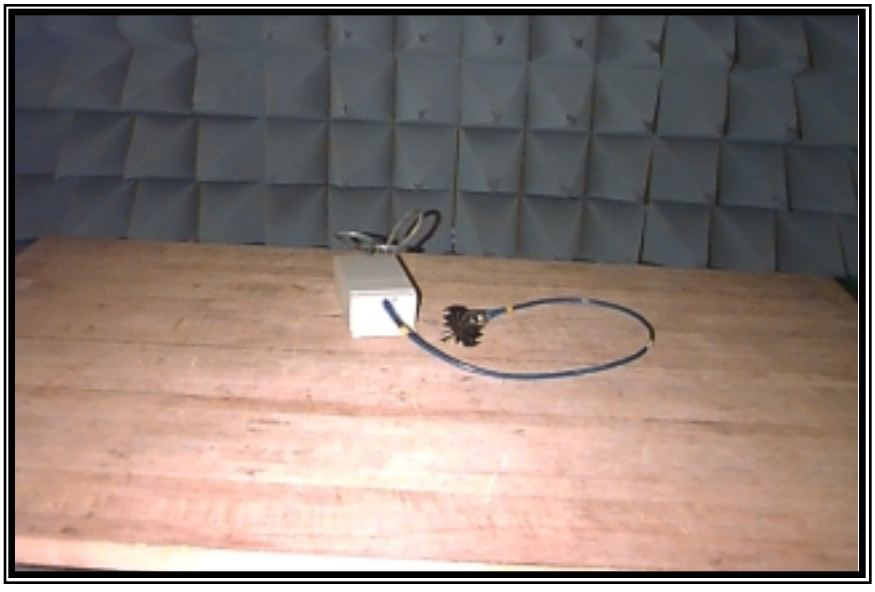

1W03937 10dB Limiter used June 29, 2001 Neutral
REF 90.0 dB V ATTEN 10 dB
10 dB/
DL
38.0
dB V
START 450 kHz
RES BW 10 kHz
VBW 30 kHz
STOP 30.0 MHz
SWP 887 msec

Conducted Photographs (Worst Case Configuration)

Side View



Front View



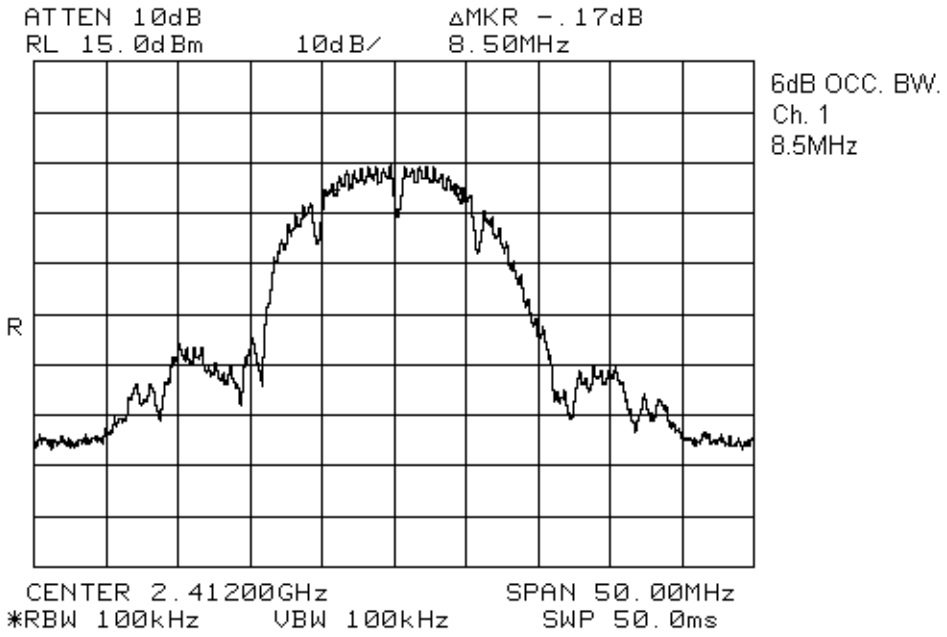
Section 4. Occupied Bandwidth

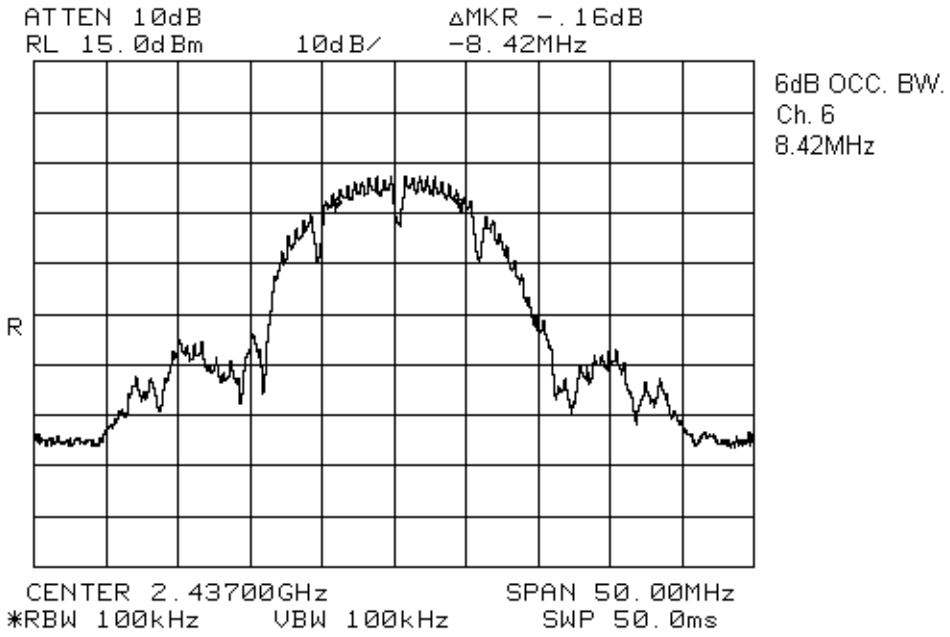
Para. No.: 15.247(a)(2)

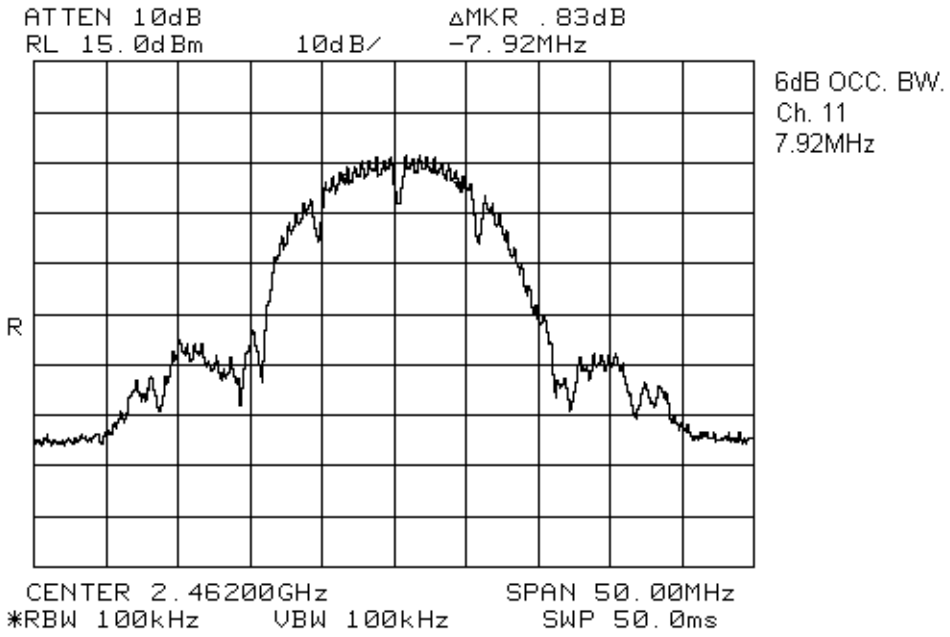
Test Performed By: Wayne Clarke	**Date of Test:** June 29, 2001

Test Results: Complies. The 6 dB bandwidth is 8.5MHz.
See attached graph.

Measurement Data: See attached graph.


ATTEN 10dB
RL 15.0dBm
10dB/
ΔMKR -.17dB
8.50MHz
6dB OCC. BW.
Ch. 1
8.5MHz
R
CENTER 2.41200GHz
SPAN 50.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms


ATTEN 10dB
RL 15.0dBm
10dB/
ΔMKR -.16dB
-8.42MHz
6dB OCC. BW.
Ch. 6
8.42MHz
R
CENTER 2.43700GHz
SPAN 50.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms


ATTEN 10dB
RL 15.0dBm
10dB/
ΔMKR .83dB
-7.92MHz
6dB OCC. BW.
Ch. 11
7.92MHz
R
CENTER 2.46200GHz
SPAN 50.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms

Section 5. Peak Power Output

Para. No.: 15.247(b)

Test Performed By: Wayne Clarke	**Date of Test:** July 16, 2001

Test Results: Complies. The maximum peak power output of the transmitter is 0.0257 watts (14.1dBm).

Measurement Data: Detachable antenna? ☒ Yes ☐ No

Standard Connector Professionally Installed.

(1) O/P Power at Antenna Connector
Channel 1: 14.1dBm = 0.0257W
Channel 6: 13.6dBm = 0.0229W
Channel 12: 13.5dBm = 0.0224W

(2) Antenna Gain: 16dBi
13dBi

(3) EIRP = 14.1dBm + 16dBi = 30.1dBm

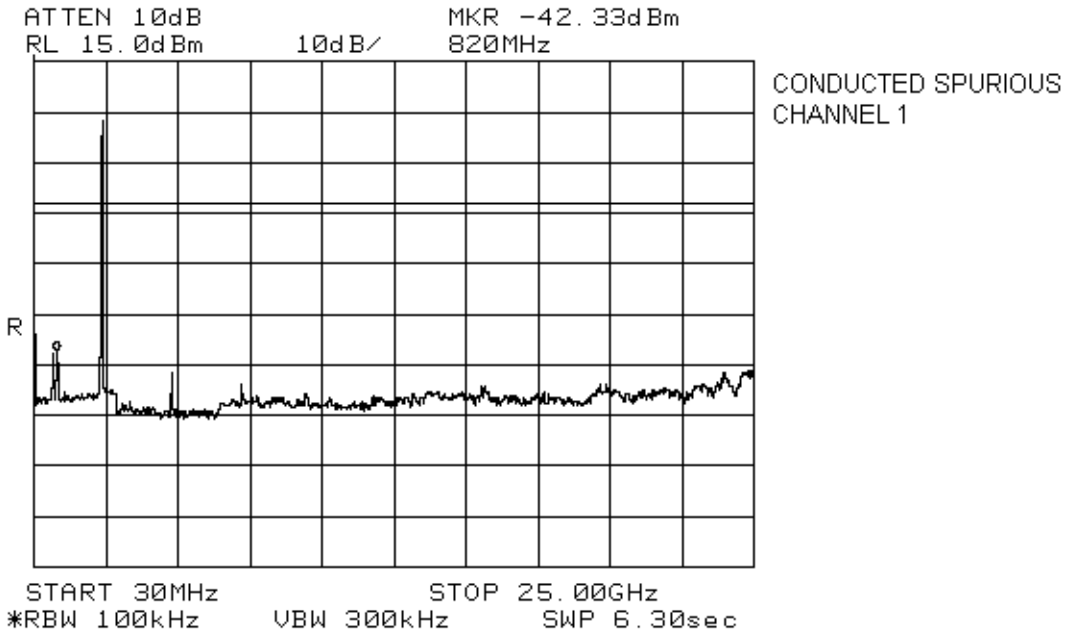
Section 6. Spurious Emissions (Antenna Conducted)

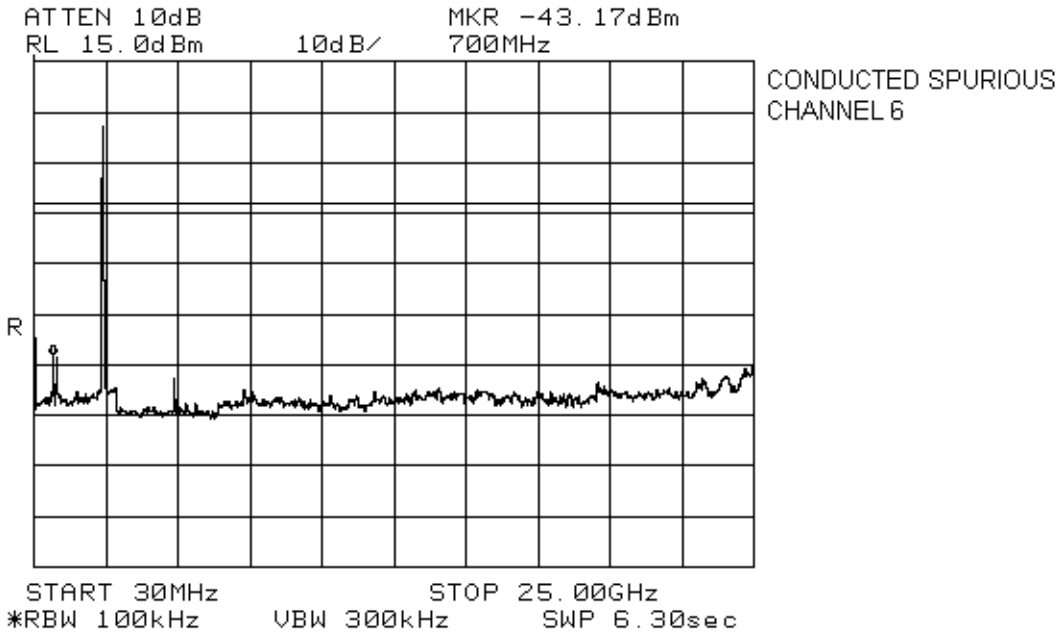
Para. No.: 15.247

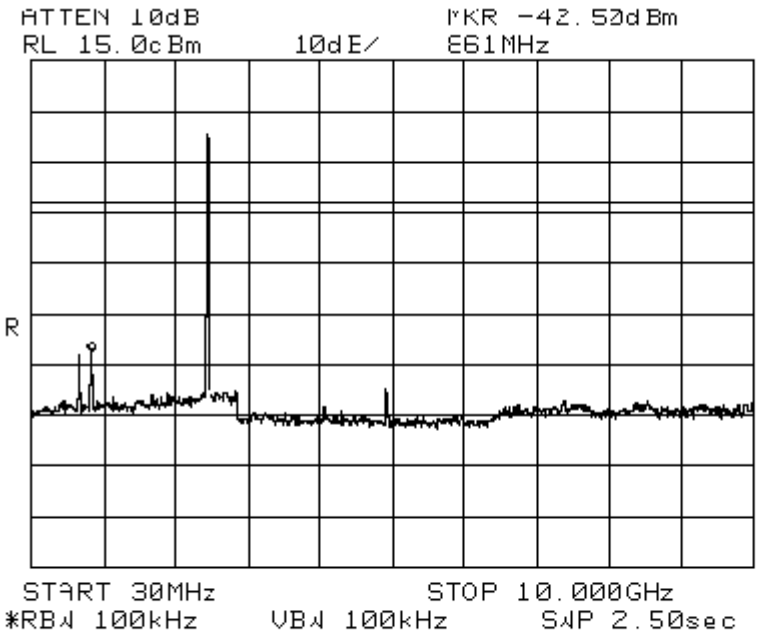
Test Performed By: Wayne Clarke	**Date of Test:** June 28, 2001

Test Results: Complies.

Measurement Data: See attached graphs.


ATTEN 10dB
RL 15.0dBm
10dB/
MKR -42.33dBm
820MHz
CONDUCTED SPURIOUS
CHANNEL 1
R
START 30MHz
STOP 25.00GHz
*RBW 100kHz
VBW 300kHz
SWP 6.30sec


ATTEN 10dB
RL 15.0dBm
10dB/
MKR -43.17dBm
700MHz
CONDUCTED SPURIOUS
CHANNEL 6
R
START 30MHz
STOP 25.00GHz
*RBW 100kHz
VBW 300kHz
SWP 6.30sec



CONDUCTED SPURIOUS
CHANNEL 11

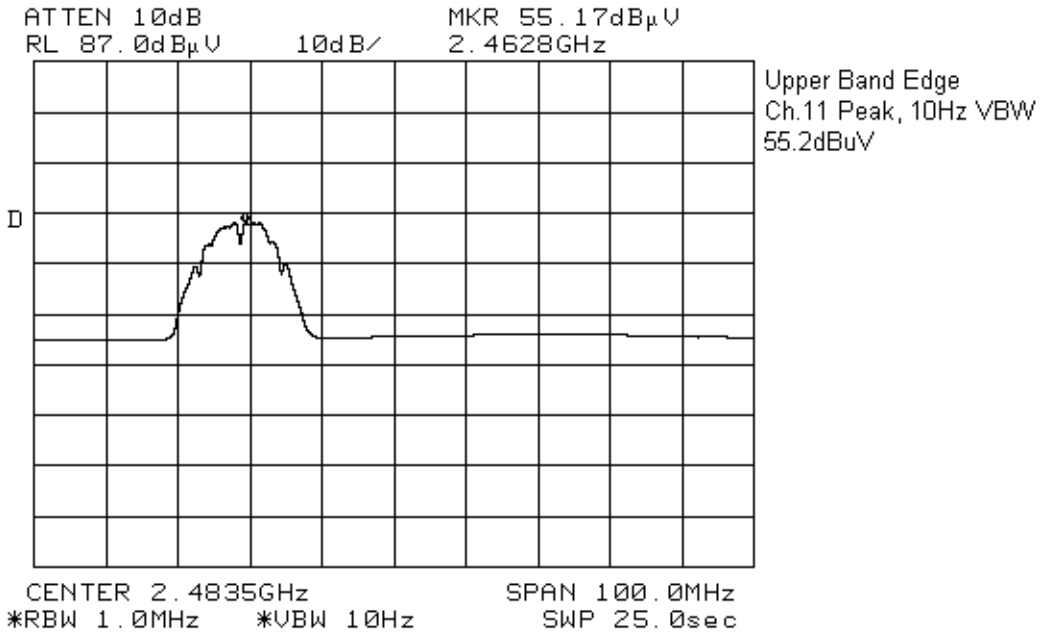
Section 7. Spurious Emissions (Radiated)

Para. No.: 15.247(c)

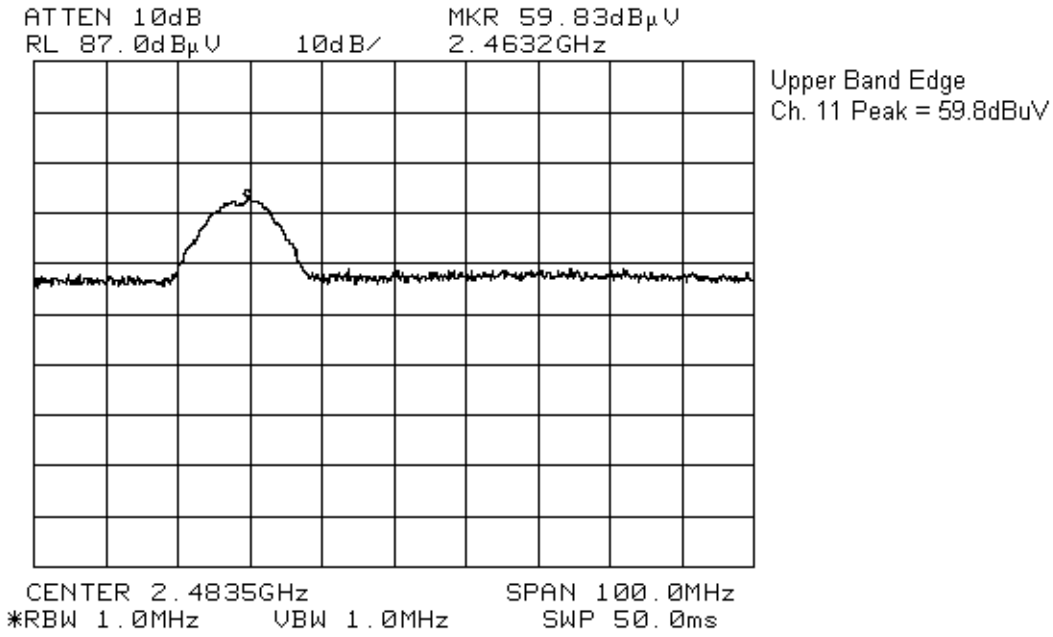
Test Performed By: Glen Westwell	**Date of Test:** July 16, 2001

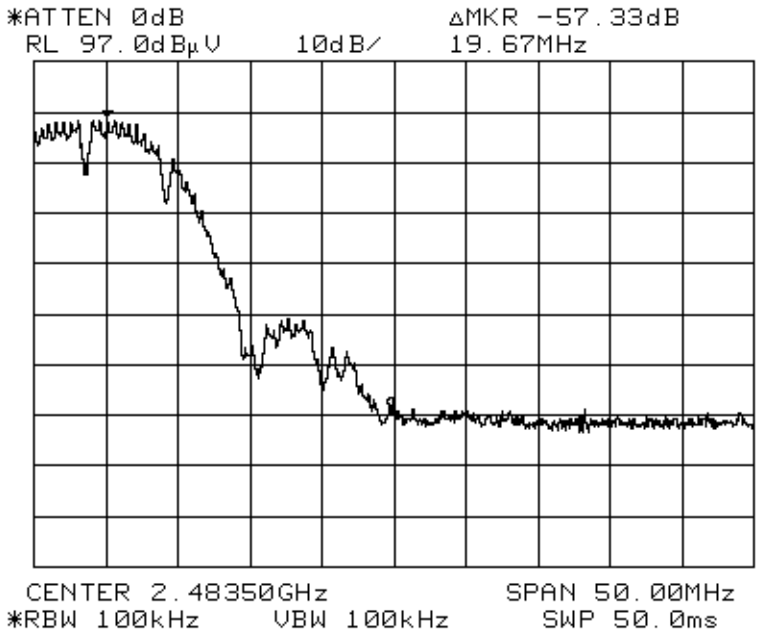
Test Results: Complies. The worst-case emission level is 52.1 dBµV/m @ 3m at 7311.0 MHz. This is 1.9 dB below the specification limit.

Measurement Data: See attached graphs.

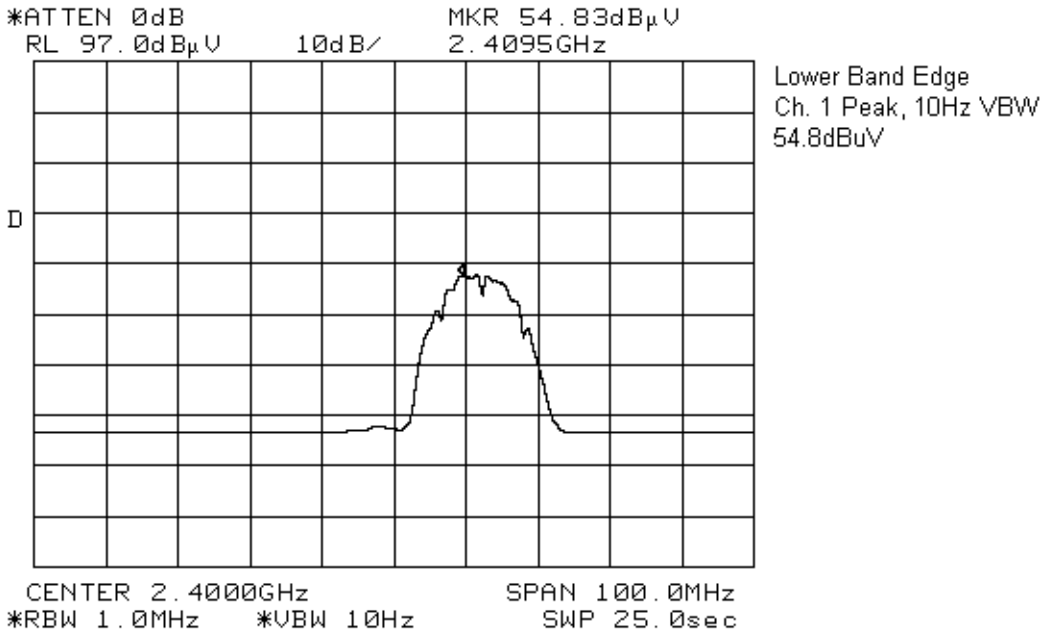


Peak Rx Signal (dBµV)	Antenna Factor	Marker Delta 100kHz RBW (dB)	Field Strength (dBµV)	Limit (dBµV)	Margin (dB)
55.2	36.1	-57.3	34	54	20

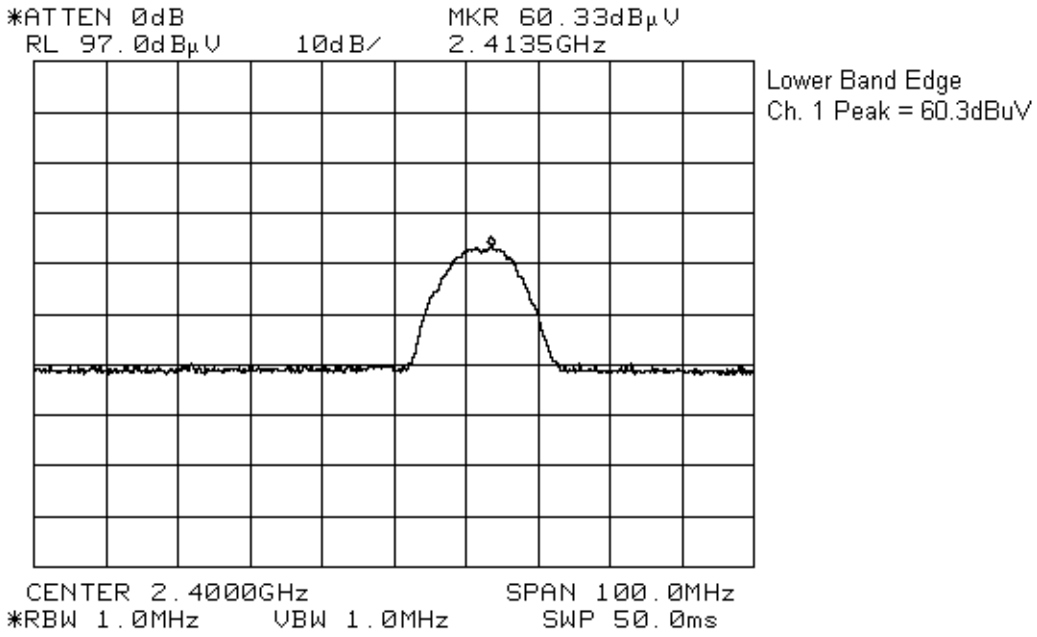

ATTEN 10dB
RL 87.0dBµV
10dB/
MKR 59.83dBµV
2.4632GHz
Upper Band Edge
Ch. 11 Peak = 59.8dBuV
CENTER 2.4835GHz
SPAN 100.0MHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 50.0ms

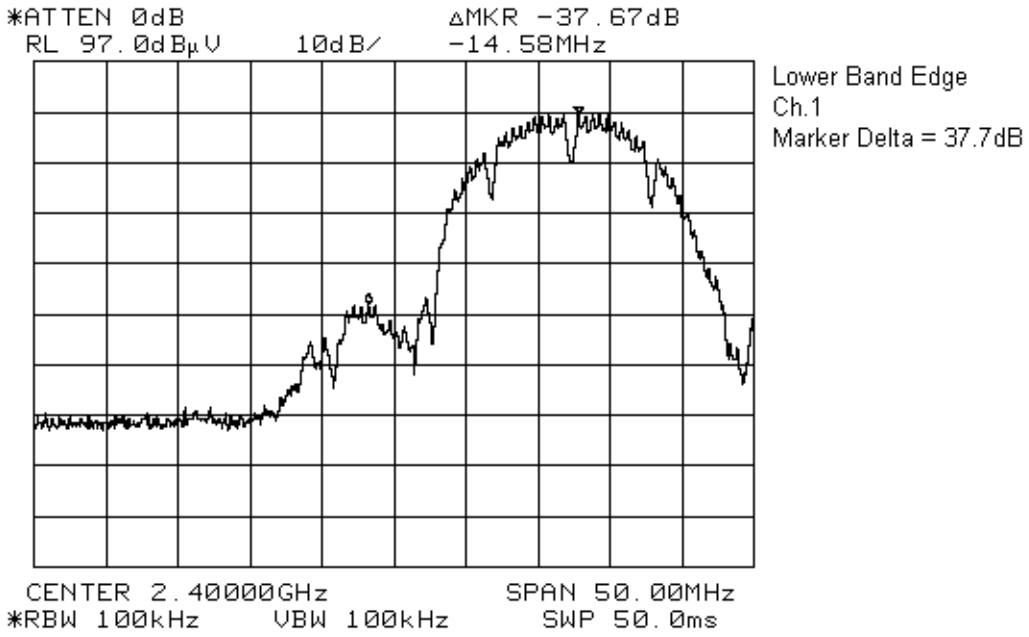


Upper Band Edge
Ch.11
Marker Delta = 57.3dB



Peak Rx Signal (dBµV)	Antenna Factor	Marker Delta 100kHz RBW (dB)	Field Strength (dBµV)	Limit (dBµV)	Margin (dB)
54.8	36.1	-37.7	53.2	70.9	17.7


*ATTEN 0dB
MKR 60.33dBµV
RL 97.0dBµV
10dB/
2.4135GHz
Lower Band Edge
Ch. 1 Peak = 60.3dBuV
CENTER 2.4000GHz
SPAN 100.0MHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 50.0ms


*ATTEN 0dB
ΔMKR -37.67dB
RL 97.0dBμV
10dB/
-14.58MHz
Lower Band Edge
Ch.1
Marker Delta = 37.7dB
CENTER 2.40000GHz
SPAN 50.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms

Test Data - Radiated Emissions (PEAK)

Test Distance (meters) : 3		Range: A Tower		Receiver: HP 8565E		RBW(kHz): 1000		Detector: Peak	
Freq. (MHz)	Ant. *	Pol. (V/H)	RCVD Signal (dBµV/m)	Ant. Factor (dB)**	Amp. Gain (dB)***	Dist. Corr. (dB)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Channel 1									
4824.0		V	56.5	43.7	-56.0		44.2	54.0	9.8
4824.0		H	60.2	43.7	-56.0		47.9	54.0	6.1
7236.0		V	51.3	50.8	-55.6		45.5	54.0	8.5
7236.0		H	55.6	50.8	-55.6		49.8	54.0	4.2
Channel 6									
4874.0		V	61.2	43.8	-55.6		49.4	54.0	4.6
4874.0		H	60.8	43.8	-55.6		49.0	54.0	5.0
7311.0		V	57.2	50.9	-56.3		52.1	54.0	1.9
7311.0		H	57.0	50.9	-56.3		51.6	54.0	2.4
Channel 11									
4924.0		V	56.5	44.0	-55.2		45.3	54.0	8.7
4924.0		H	35.7	44.0	-55.2		44.5	54.0	9.5
7386.0		V	N.D.	51.1	-56.0		N/A	54.0	N/A
7386.0		H	N.D.	51.5	-56.0		N/A	54.0	N/A

Notes:

B/C = Biconical, B/L = Biconilog, L/P = Log-Periodic, H = Horn, D/P = Dipole
* Re-measured using dipole antenna.
** Includes cable loss when amplifier is not used.
*** Includes cable loss.
( ) Denotes failing emission level.
N.D. = Not Detected

All emissions were searched up to the 10th harmonic.

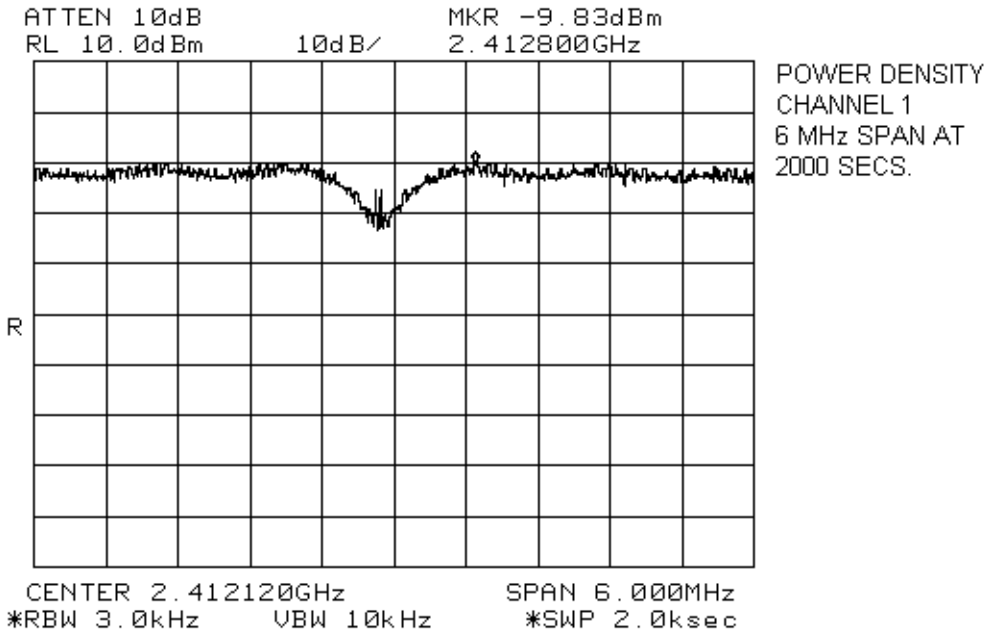
Section 8. Transmitter Power Density

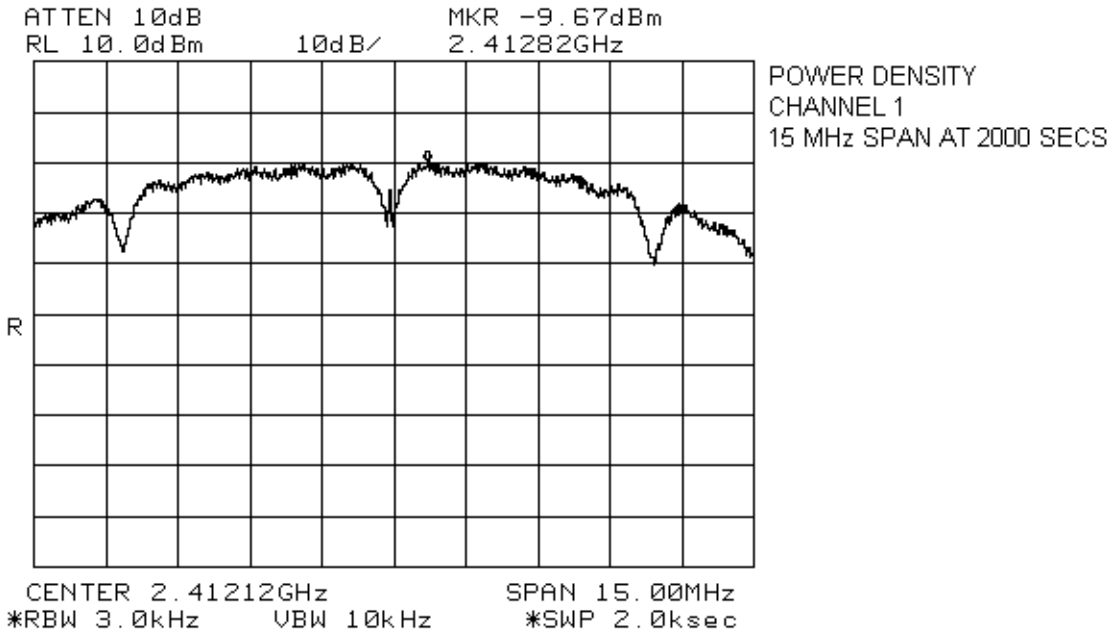
Para. No.: 15.247(d)

Test Performed By: Wayne Clarke	**Date of Test:** June 29, 2001

Test Results: Complies.

Measurement Data: See attached graphs.


ATTEN 10dB
RL 10.0dBm
10dB/
MKR -9.83dBm
2.412800GHz
POWER DENSITY
CHANNEL 1
6 MHz SPAN AT
2000 SECS.
R
CENTER 2.412120GHz
SPAN 6.000MHz
*RBW 3.0kHz
VBW 10kHz
*SWP 2.0ksec


ATTEN 10dB
RL 10.0dBm
10dB/
MKR -9.67dBm
2.41282GHz
POWER DENSITY
CHANNEL 1
15 MHz SPAN AT 2000 SECS
R
CENTER 2.41212GHz
SPAN 15.00MHz
*RBW 3.0kHz
VBW 10kHz
*SWP 2.0ksec

Section 9. Processing Gain

Para. No.: 15.247(e)

Test Performed By: Manufacturer	**Date of Test:** May 30, 2001

Test Results: Complies. The processing gain of the system is >10dB.

Measurement Data: See attached data.

Lucent Technologies
Bell Labs Innovations
Nederland B.V.

Zadelstede 1-10
3431 JZ Nieuwegein
The Netherlands
Phone: +31 30 6097666
Fax: +31 30 6097556

FCC...

Nieuwegein, 30 May 2001

Re: Processing Gain WaveLAN/Orinoco PC Cards
Add. Info to Processing Gain report:

For Chip/symbol rate etc. see the table below:

Bit rate	Chip/symbol rate	Bit/symbol rate	Chip/bit rate
1 Mbit/sec	11	1, DBPSK	11
2 Mbit/sec	11	2, DQPSK	5.5
5.5 Mbit/sec	8	4, CCK	2
11 Mbit/sec	8	8, CCK	1

Extra Information:

1. For 1 and 2 Mbp/s DQPSK modulation using a fixed spreading sequence the symbol rate is 1 MSymbol/s. The symbol length is 11 chips. Each chip duration is 1/11 uS. A symbol duration is 1 uS.

   The chip/symbol rate is 11. The theoretical process gain is 10*LOG(11) = 10 dB.

2. For 5.5 and 11 Mbp/s CCK where the spreading sequence is a function of the transmitted data, the symbol rate is 8/11 MSymbol/s. The symbol length is 8 chips. Each chip duration is 1/11 uS. A symbol duration is 8/11 uS.

   The chip/symbol rate is 8.
   The theoretical process gain is 10*LOG(8) = 9 dB. Due to the fact that only 256 code sequences out of the 65536 code sequences that are available are used, there is coding gain. Therefore the processing gain of a CCK system consists of spreading gain and coding gain together. As such a CCK system does meet the FCC requirement for a process gain of minimal 10 dB.

   Explanation:
   The Lucent High Speed modulation is compliant to draft standard extension IEEE 802.11b for 5.5 and 11 MBit/s signaling rates. For this modulation technique the Symbol length is 8 Chips (1 Symbol duration equals 8/11 uS). However, the 8 Chips are not a fixed spreading sequence as is the case for the 1 and 2 MBit/s modulation technique. These 8 Chips, applied in a QPSK modulation, use 256 unique patterns out of the 65536 different possible patterns, whereby each pattern represents a specific data sequence (4 or 8 bits). Thus this type of modulation introduces Coding Gain, since only 256 patterns are used out of 65536 possible combinations.

   Therefore it can be concluded that the system employs Coding Gain in addition to Spreading Gain.

   The Processing Gain of the system is taken as the combined result of Coding and Spreading Gain, so a Processing Gain of 10 dB can be met with 8 Chips per Symbol.

   Lucent has shown by a CW jammer margin test that a SIR of 10 dB can be met, while meeting the system specified BER. It is our understanding that this is compliant with the FCC ruling.

   Therefore the test report shows that the Lucent product, operating at 1, 2, 5.5 and 11 Mbit/s meets a Processing Gain of at least 10 dB, under the conditions as specified by the FCC.

Sincerely yours,

Bert Vos, Certifications Support,

Section 10. Test Equipment List

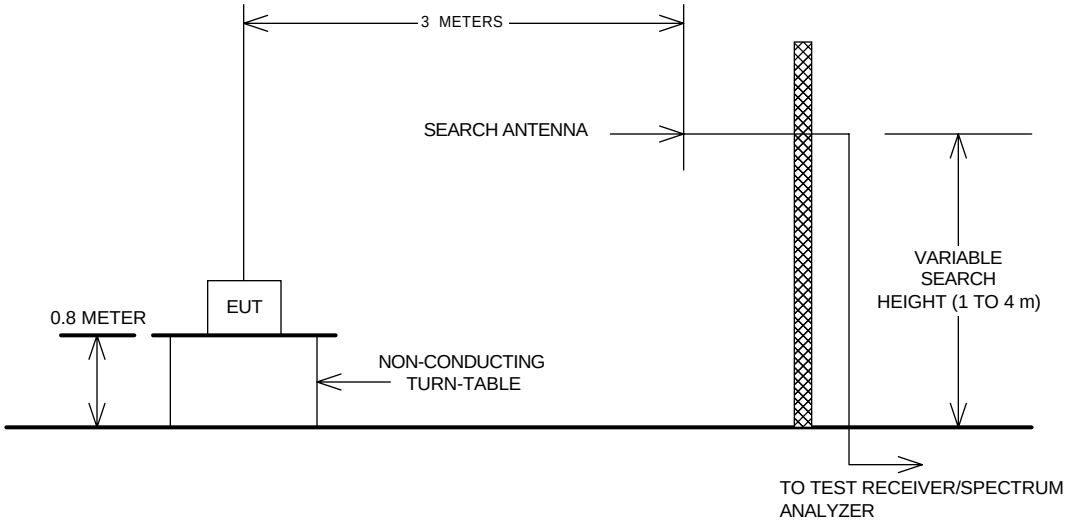
CAL CYCLE	EQUIPMENT	MANUFACTURER	MODEL	SERIAL	LAST CAL.	NEXT CAL.
1 Year	Spectrum Analyzer	Hewlett Packard	8565E	FA000981	June 08/01	June 08/02
1 Year	Spectrum Analyzer-**1**	Hewlett Packard	8566B	2311A02238	Dec. 10/00	Dec. 10/01
1 Year	Spectrum Analyzer Display-**1**	Hewlett Packard	8566B	2314A04759	Dec. 10/00	Dec. 10/01
1 Year	Quasi-peak adapter-**1**	Hewlett-Packard	85650A	2043A00302	Dec. 14/00	Dec. 14/01
1 Year	Attenuator	Narda	768-10	9709	Oct. 8/99	Oct. 8/00
1 Year	LISN	Tegam	95300-50	T-12855/56	Oct. 19/00	Oct. 19/01
1 Year	Horn Antenna	EMCO #1	3115	3132	Dec. 11/00	Dec. 11/01
1 Year	RF AMP	JCA	4-8 GHz	FA001497	May 31/01	May 31/02
1 Year	Plotter	Hewlett Packard	7550A	FA001129	NCR	NCR
1 Year	Notch Filter	K&L	3TNF-1-2000	127	Aug. 23/99	Aug. 23/00
	High Pass Filter	K&L	11SH10-4000	FA001340	COU	COU
1 Year	Power Meter	Hewlett Packard	E4448B	FA001413	Jan. 16/01	Jan. 16/02
1 Year	Power Sensor	Hewlett Packard	8487A	FA001419	Jan. 16/01	Jan. 16/02

NA: Not Applicable
NCR: No Cal Required
COU: CAL On Use

Annex A

Block Diagrams

Test Site For Radiated Emissions

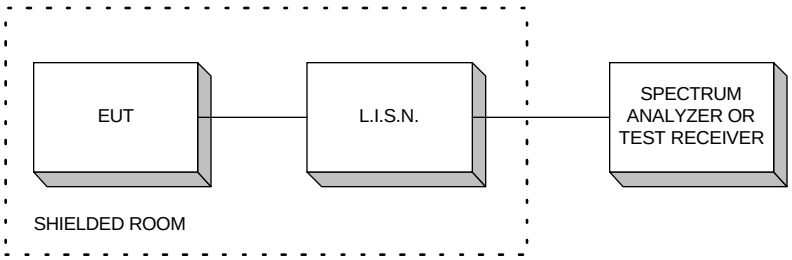


Below 1 GHz
Peak detector.
RBW = 100 kHz

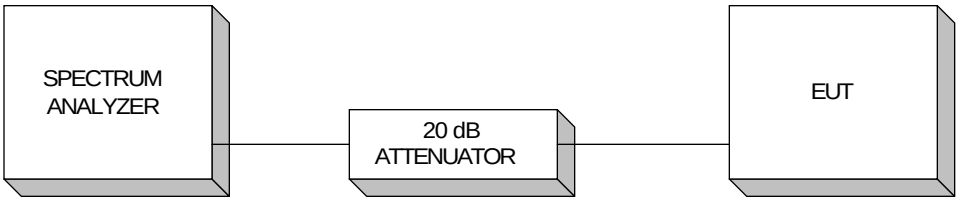
Above 1 GHz For Peak Emission Levels
Peak detector
RBW = 1 MHz
VBW = >RBW

Above 1 GHz For Average Emission Levels
Peak detector
RBW = 1 MHz
VBW = 10 Hz

Conducted Emissions

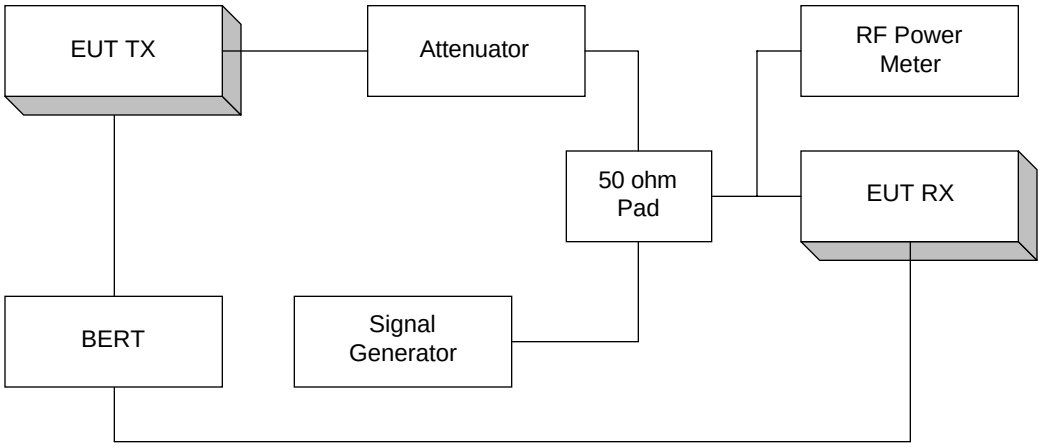


Transmitter Power Density & Peak Power At Antenna Terminals



If the EUT has an integral (non-detachable) antenna, the above test is performed as a radiated measurement and the result is reported as EIRP.

Processing Gain



NOTE: This is a typical setup. The setup may vary slightly since many devices have BER test functions built into the device.