FCC CFR47 PART 15 SUBPART C
CERTIFICATION
TEST REPORT

FOR

802.11 BASED, FIXED WIRELESS NODE

MODEL: SkyConnector INDOOR SC1010 AND OUTDOOR SC1010

FCC ID: RV7-SC1010

REPORT NUMBER: 04U2978-3

ISSUE DATE: SEPTEMBER 29, 2004

Prepared for
SKYPILOT NETWORK, INC.
1301 SHOREWAY ROAD STE 211
BELMONT, CA 94002
USA

Prepared by
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1. TEST RESULT DECLARATION

COMPANY NAME: SKYPILOT NETWORK, INC.
1301 SHOREWAY ROAD STE 211
BELMONT, CA 94002

EUT DESCRIPTION: 802.11 BASED, FIXED WIRELESS NODE

MODEL: SkyConnector INDOOR SC1010 AND OUTDOOR SC1010

DATE TESTED: SEPTEMBER 27 –SEPTEMBER 28, 2004

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Approved & Released For CCS By:

YAN ZHENG
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

DAVID GARCIA
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. EUT DESCRIPTION

The EUT is an 802.11a transceiver operating in the 5725-5850 MHz band. It is intended for use as a fixed Wireless Subscriber unit.

Two versions are produced: an indoor unit (model: Indoor SC1010) and an outdoor unit (model: Outdoor SC1010). The hardware and antenna are identical for each version. The electronics are entirely shielded for each version.

On the indoor unit the metal utilized for the rear shield plate is stamped. On the outdoor unit the metal utilized for the rear shield plate, which also serves as the mounting plate, is cast so as to provide for a weatherproof enclosure when the front plastic cover is installed.

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5745 - 5835	802.11a	25.53	357.27

The radio utilizes a panel antenna with a maximum gain of 16.5 dBi in the 5.8 GHz band. It is used for point-to-point operation.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4/2001, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.

5. CALIBRATION AND UNCERTAINTY

5.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

5.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5.3. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Due**
Antenna, Horn 1 ~ 18 GHz	**EMCO**	**3117**	**29310**	**9/12/2005**
EMI Test Receiver	**R & S**	**ESIB40**	**100192**	**11/21/2004**
Preamplifier, 1 ~ 26 GHz	**Miteq**	**NSP10023988**	**646456**	**8/17/2005**
30MHz---- 2Ghz	**Sunol Sciences**	**JB1 Antenna**	**A121003**	**12/22/2004**
EMI Receiver, 9 kHz ~ 2.9 GHz	**HP**	**8542E**	**3942A00286**	**11/21/2004**
RF Filter Section	**HP**	**85420E**	**3705A00256**	**11/21/2004**
LISN, 10 kHz ~ 30 MHz	**FCC**	**50/250-25-2**	**114**	**10/13/2004**
LISN, 10 kHz ~ 30 MHz	**Solar**	**8012-50-R-24-BNC**	**8379443**	**10/13/2004**
Site A Line Stabilizer / Conditioner	**Tripplite**	**LC-1800a**	**A0051681**	**CNR**
EMI Test Receiver	**R & S**	**ESHS 20**	**827129/006**	**10/22/2005**
Antenna, Horn 18 ~ 26 GHz	**ARA**	**MWH-1826/B**	**1013**	**9/12/2005**

6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Notebook PC	Dell	PP01X	43166700181	N/A
Junction	N/A	640-00009-01	N/A	N/A

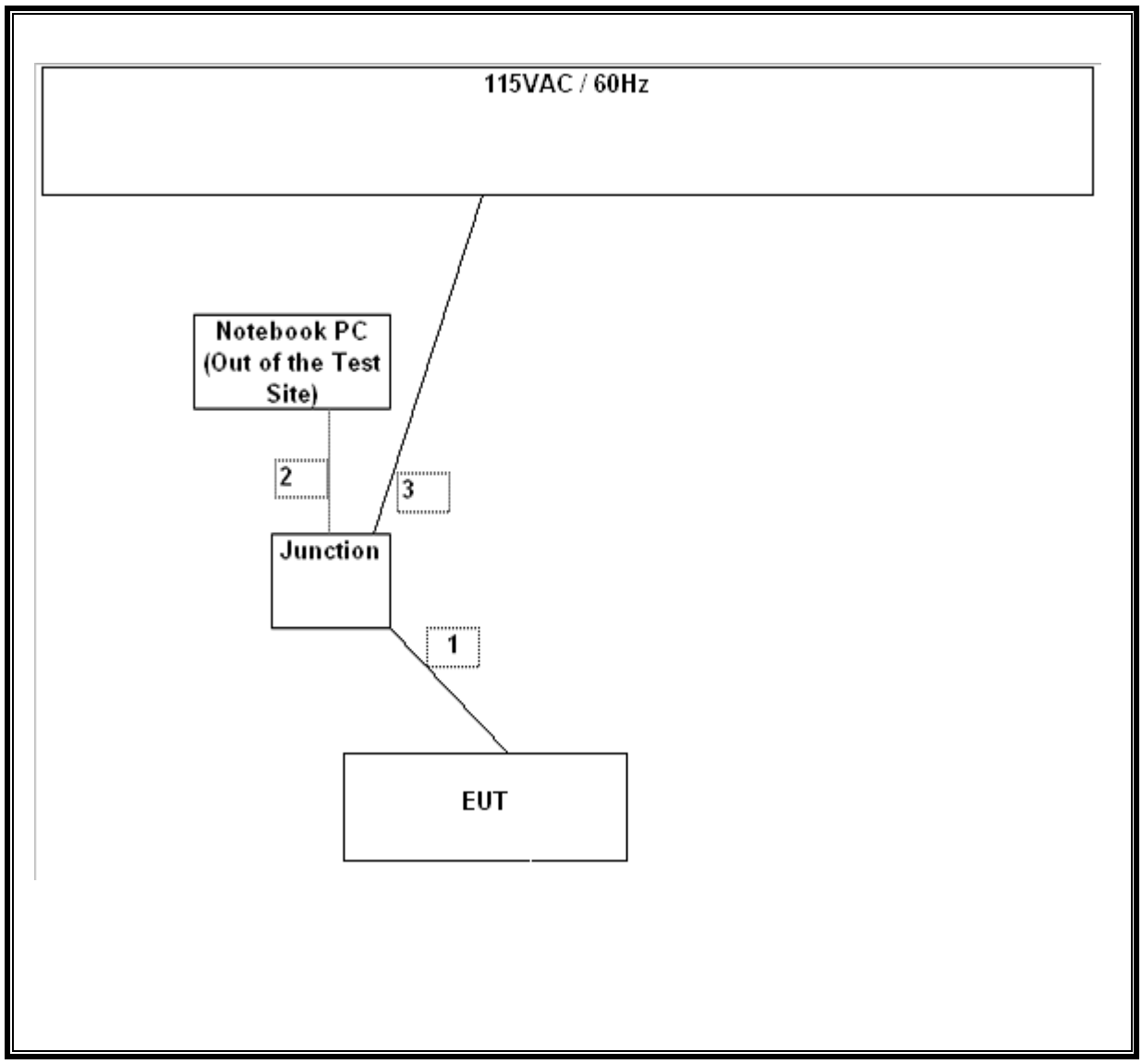
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	I/O	1	RJ 45	unshield	4m	POE
2	I/O of Junction	1	RJ 45	unshield	15m	From Junction to PC
3	AC Power	1		unshield	2m	N/A

TEST SETUP

The test software was utilitized to controls the EUT.

SETUP DIAGRAM FOR TESTS



7. APPLICABLE LIMITS AND TEST RESULTS

7.1. 6 dB BANDWIDTH

LIMIT

§15.247 (a) (2) For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

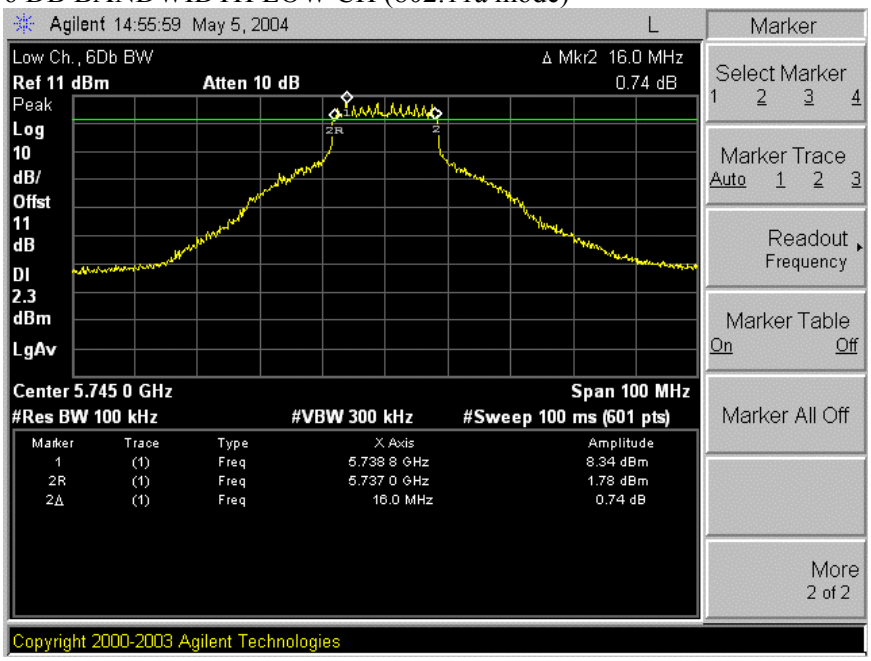
No non-compliance noted:

802.11a Mode

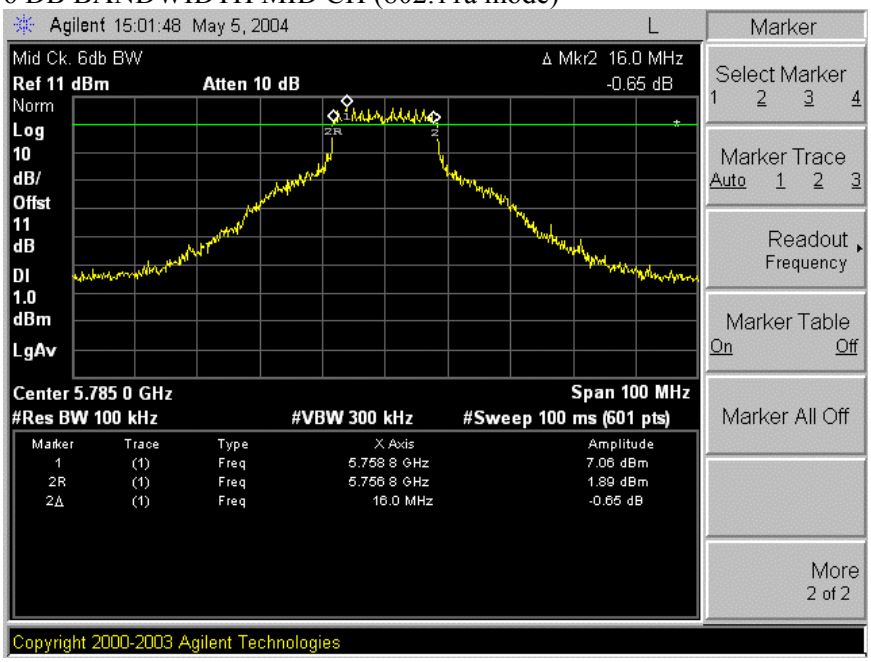
Channel	Frequency (MHz)	6 dB Bandwidth (KHz)	Minimum Limit (kHz)	Margin (kHz)
Low	5745	16000	500	15500
Middle	5785	16000	500	15500
High	5835	16500	500	16000

6 DB BANDWIDTH (802.11a MODE)

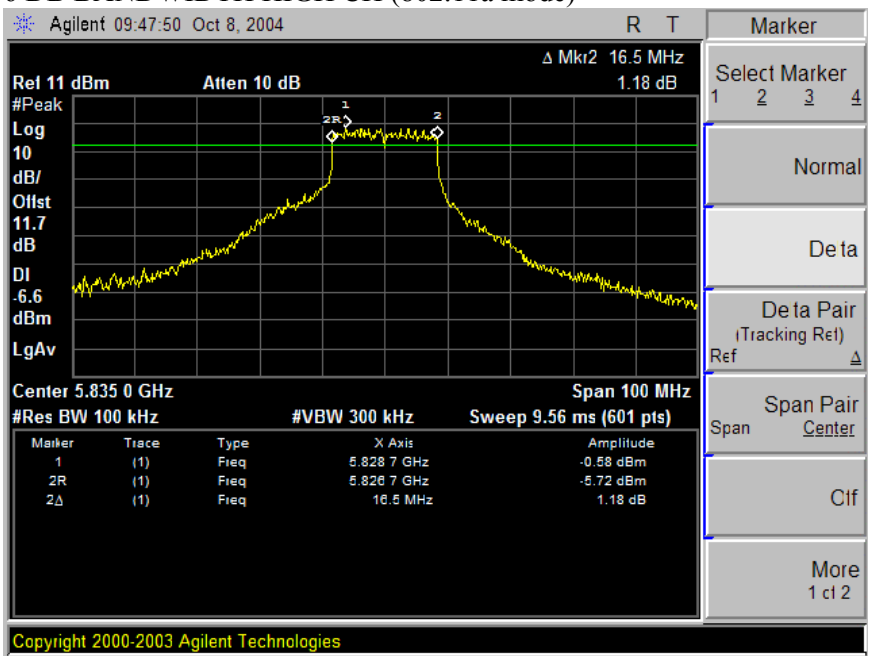
6 DB BANDWIDTH LOW CH (802.11a mode)



6 DB BANDWIDTH MID CH (802.11a mode)



6 DB BANDWIDTH HIGH CH (802.11a mode)



7.2. 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

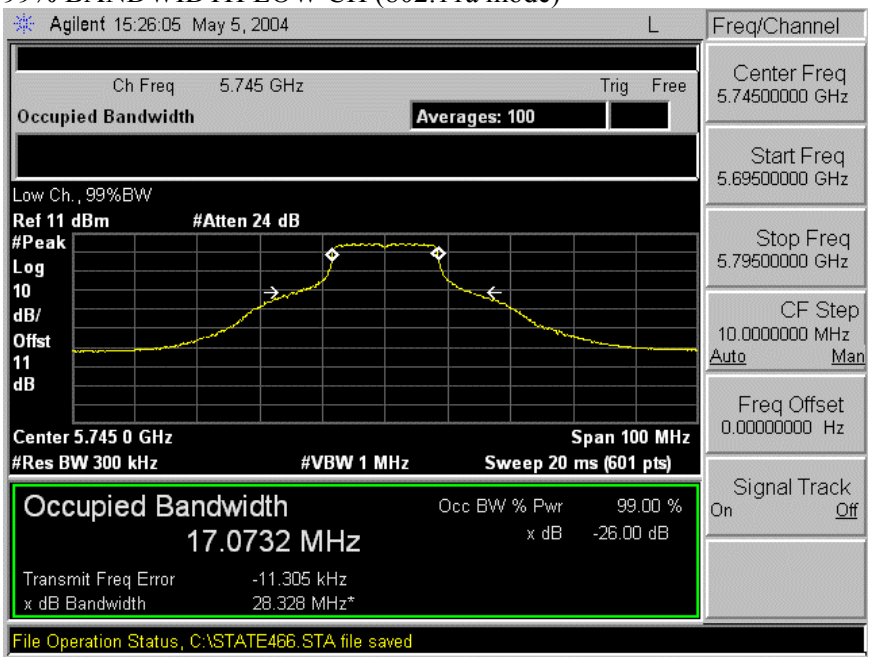
No non-compliance noted:

802.11a Mode

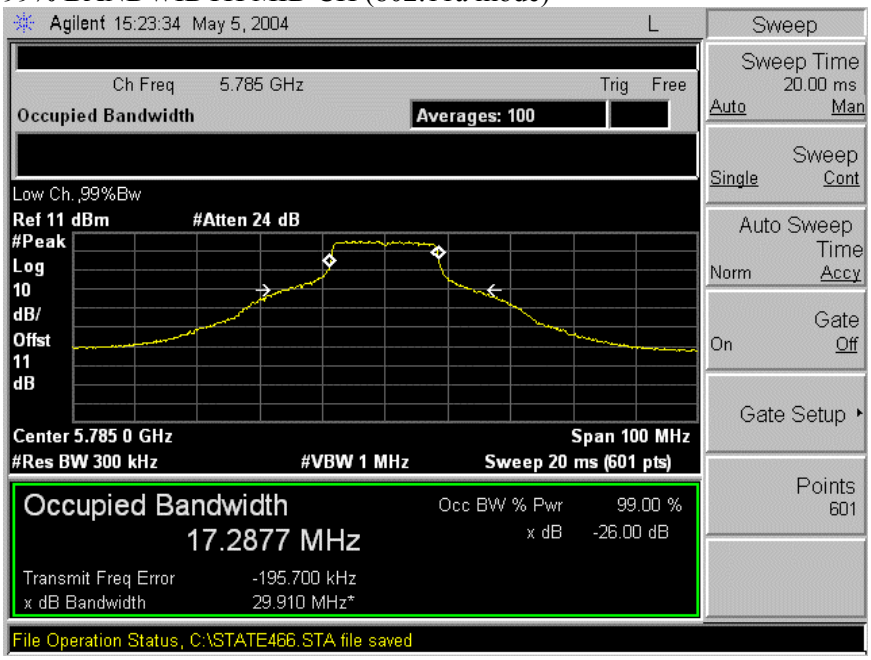
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	17.0732
Middle	5785	17.2877
High	5835	17.0621

99% BANDWIDTH (802.11a MODE)

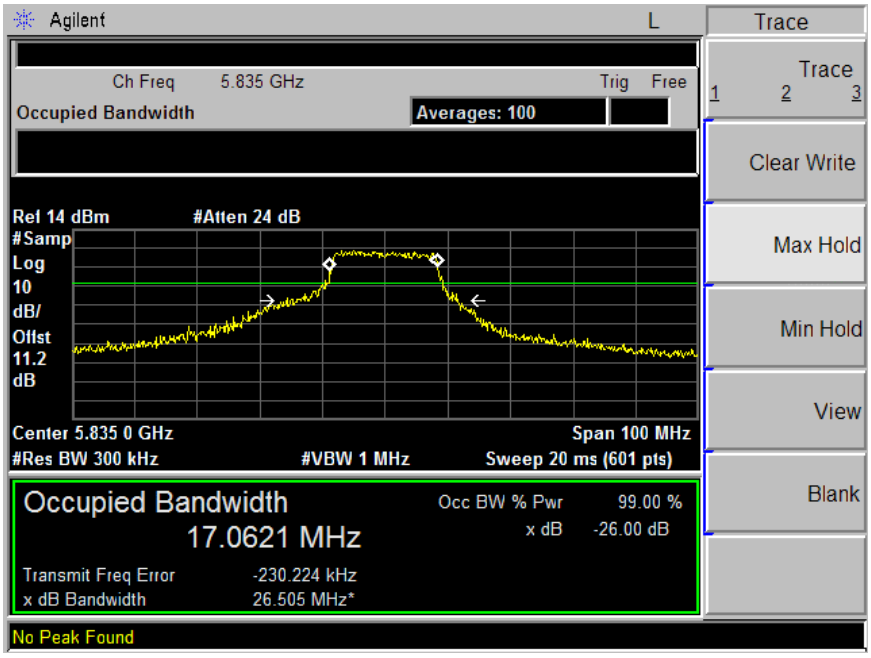
99% BANDWIDTH LOW CH (802.11a mode)



99% BANDWIDTH MID CH (802.11a mode)



99% BANDWIDTH HIGH CH (802.11a mode)



7.3. PEAK OUTPUT POWER

PEAK POWER LIMIT

§15.247 (b) The maximum peak output power of the intentional radiator shall not exceed the following:

§15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz , and 5725-5850 MHz bands: 1 watt.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.

RESULTS

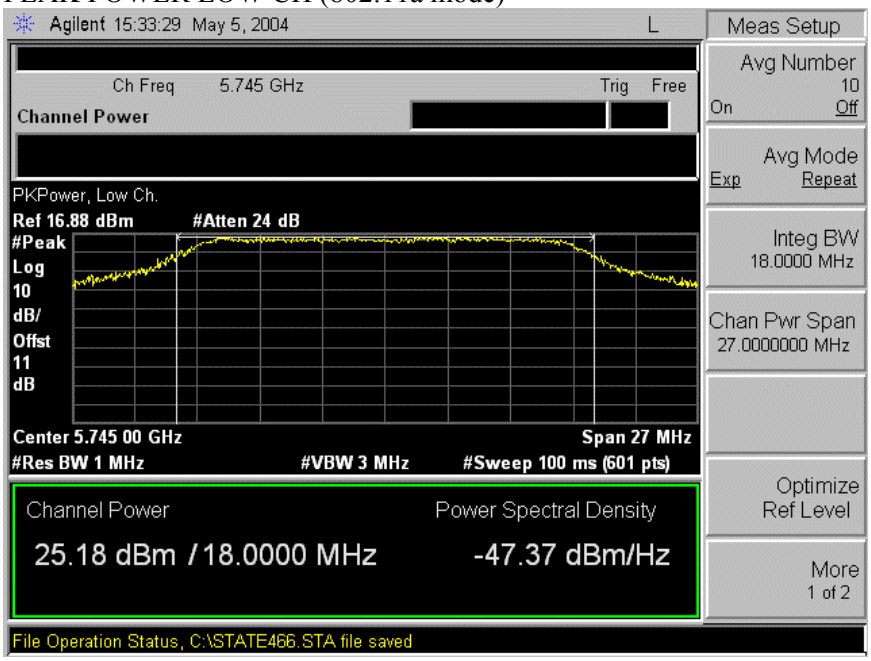
No non-compliance noted:

802.11a Mode

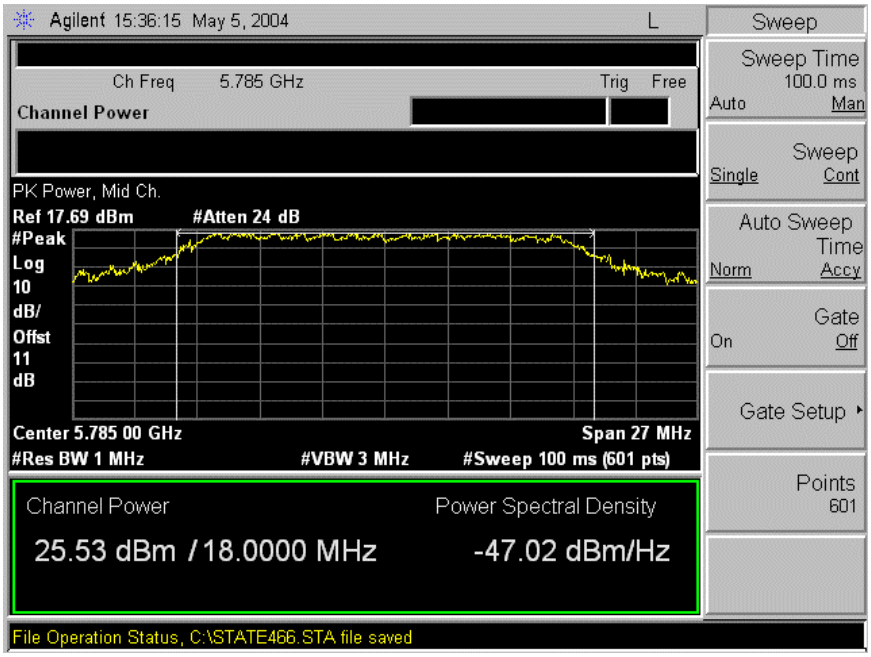
Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	5745	25.18	30	-4.82
Middle	5785	25.53	30	-4.47
High	5835	22.51	30	-7.49

OUTPUT POWER (802.11a MODE)

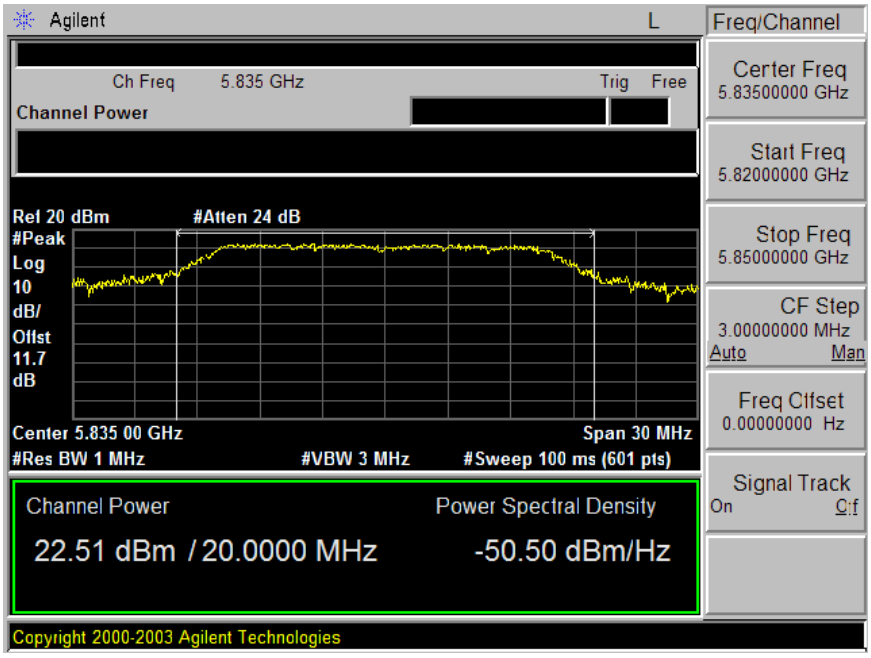
PEAK POWER LOW CH (802.11a mode)



PEAK POWER MID CH (802.11a mode)



PEAK POWER HIGH CH (802.11a mode)



7.4. MAXIMUM PERMISSIBLE EXPOSURE

LIMITS

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*($900/f^2$)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*($180/f^2$)	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density
NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

CALCULATIONS

Given

$E = \sqrt{(30 * P * G)} / d$

and

$S = E \wedge 2 / 3770$

where

E = Field Strength in Volts/meter
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power Density in milliwatts/square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

$d = \sqrt{((30 * P * G) / (3770 * S))}$

Changing to units of Power to mW and Distance to cm, using:

P (mW) = P (W) / 1000 and
d (cm) =100 * d (m)

yields

$d = 100 * \sqrt{((30 * (P / 1000) * G) / (3770 * S))}$
$d = 0.282 * \sqrt{(P * G / S)}$

where

d = distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power Density in mW/cm^2

Substituting the logarithmic form of power and gain using:

P (mW) = 10 ^ (P (dBm) / 10) and
G (numeric) = 10 ^ (G (dBi) / 10)

yields

$d = 0.282 * 10 \wedge ((P + G) / 20) / \sqrt{S}$ Equation (1)

where

d = MPE distance in cm
P = Power in dBm
G = Antenna Gain in dBi
S = Power Density Limit in mW/cm^2

Equation (1) and the measured peak power is used to calculate the MPE distance.

LIMITS

From §1.1310 Table 1 (B), S = 1.0 mW/cm^2

5.8 GHz BAND RESULTS

No non-compliance noted:

Mode	Power Density Limit (mW/cm^2)	Output Power (dBm)	Antenna Gain (dBi)	MPE Distance (cm)
802.11a	1.0	25.53	16.50	35.62

7.5. AVERAGE POWER

AVERAGE POWER LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

No non-compliance noted:

The cable assembly insertion loss of 11.7 dB (including 10 dB pad and 1.7 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

802.11a Mode

Channel	Frequency (MHz)	Average Power (dBm)
Low	5745	19.8
Middle	5785	19.4
High	5835	16.6

7.6. PEAK POWER SPECTRAL DENSITY

LIMIT

§15.247 (d) For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer, the maximum level in a 3 kHz bandwidth is measured with the spectrum analyzer using RBW = 3 kHz and VBW > 3 kHz, sweep time = span / 3 kHz, and video averaging is turned off. The PPSD is the highest level found across the emission in any 3 kHz band.

RESULTS

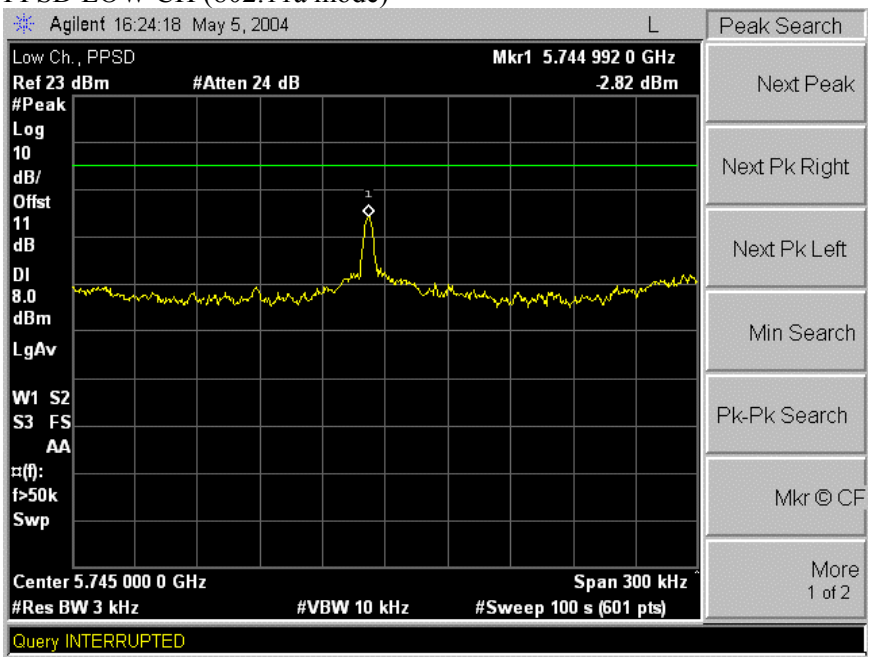
No non-compliance noted:

802.11a Mode

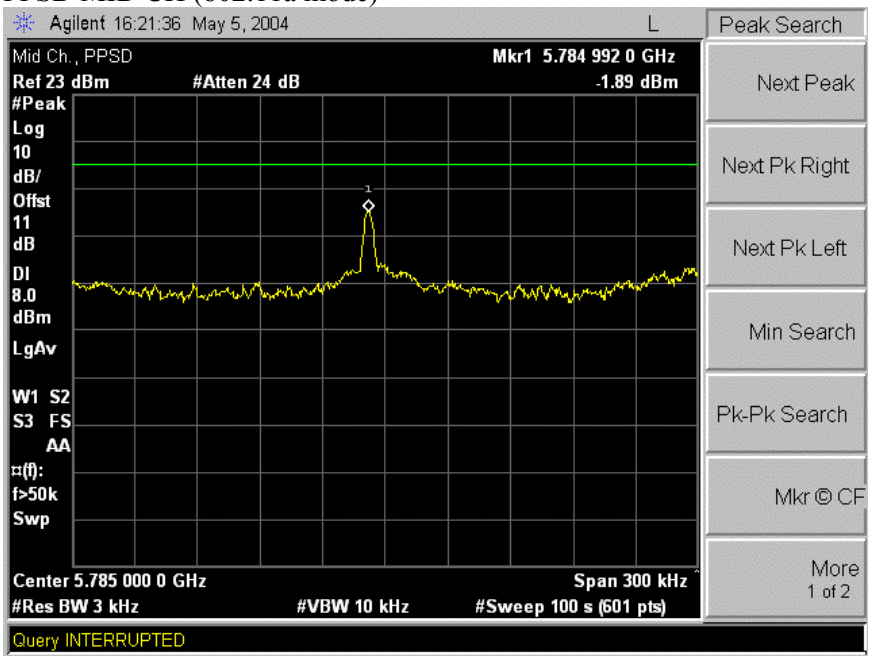
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5745	-2.82	8	-10.82
Middle	5785	-1.89	8	-9.89
High	5835	-10.09	8	-18.09

PEAK POWER SPECTRAL DENSITY (802.11a MODE)

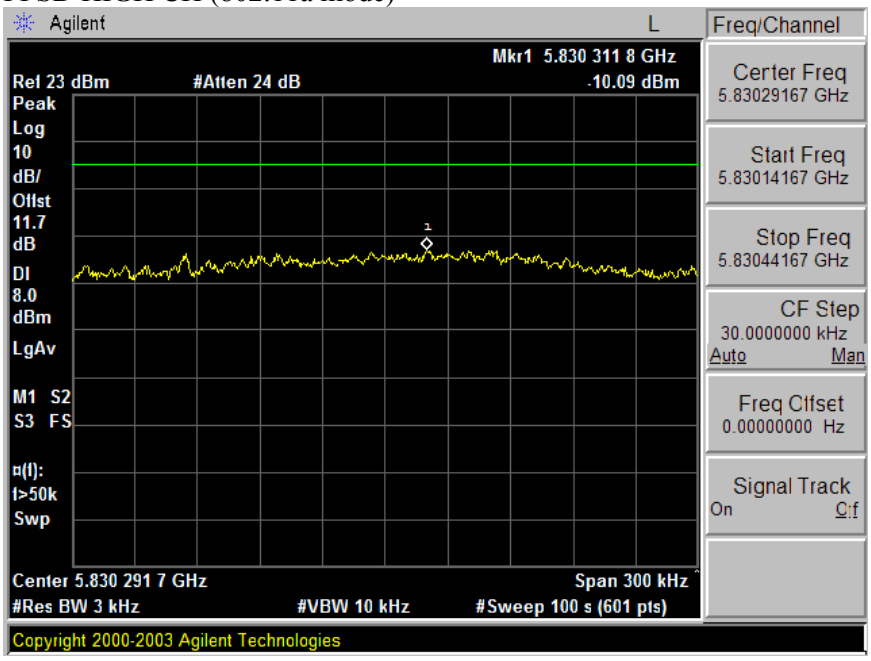
PPSD LOW CH (802.11a mode)



PPSD MID CH (802.11a mode)



PPSD HIGH CH (802.11a mode)



7.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

§15.247 (c) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in§15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

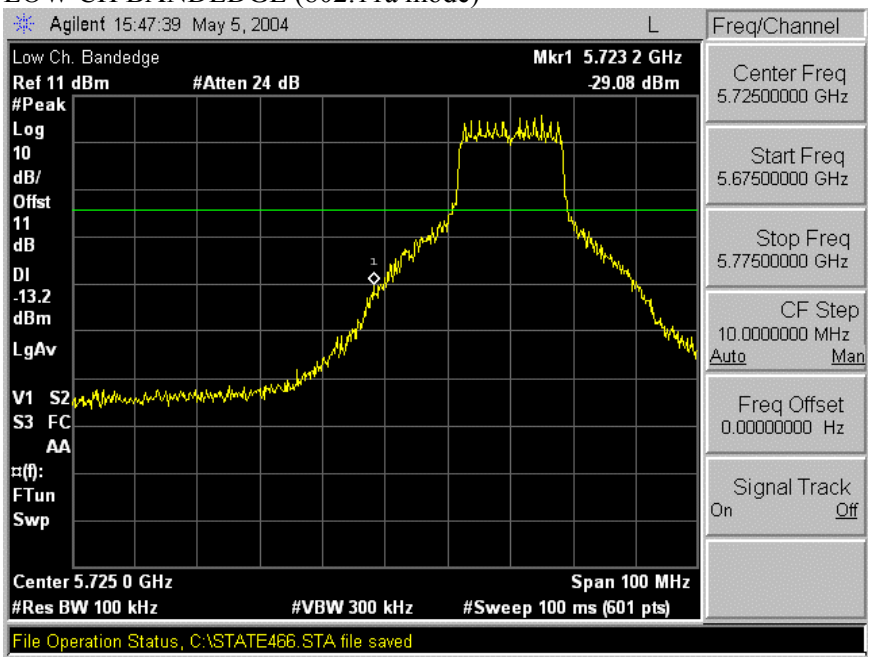
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

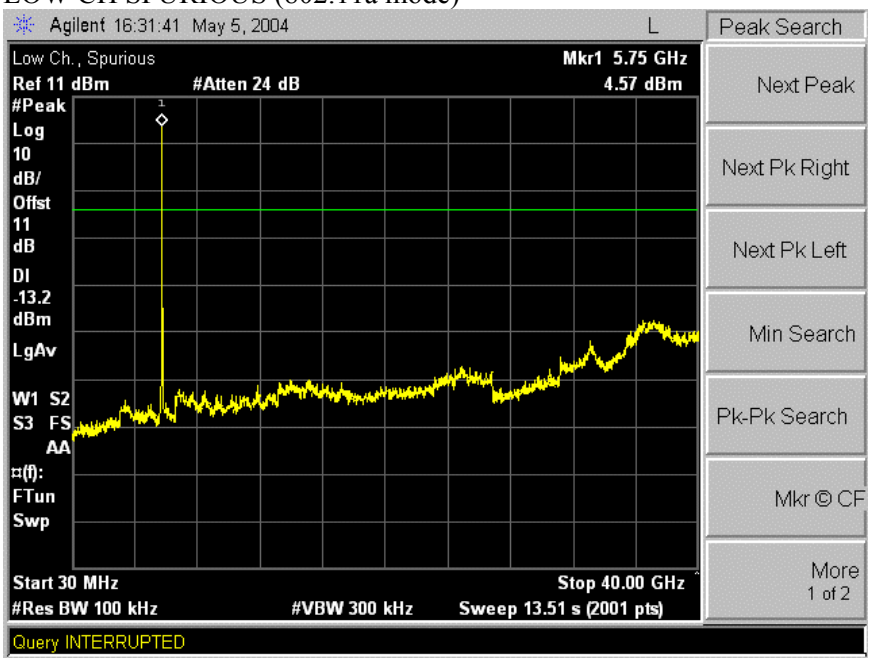
No non-compliance noted:

SPURIOUS EMISSIONS, LOW CHANNEL (802.11a MODE)

LOW CH BANDEDGE (802.11a mode)

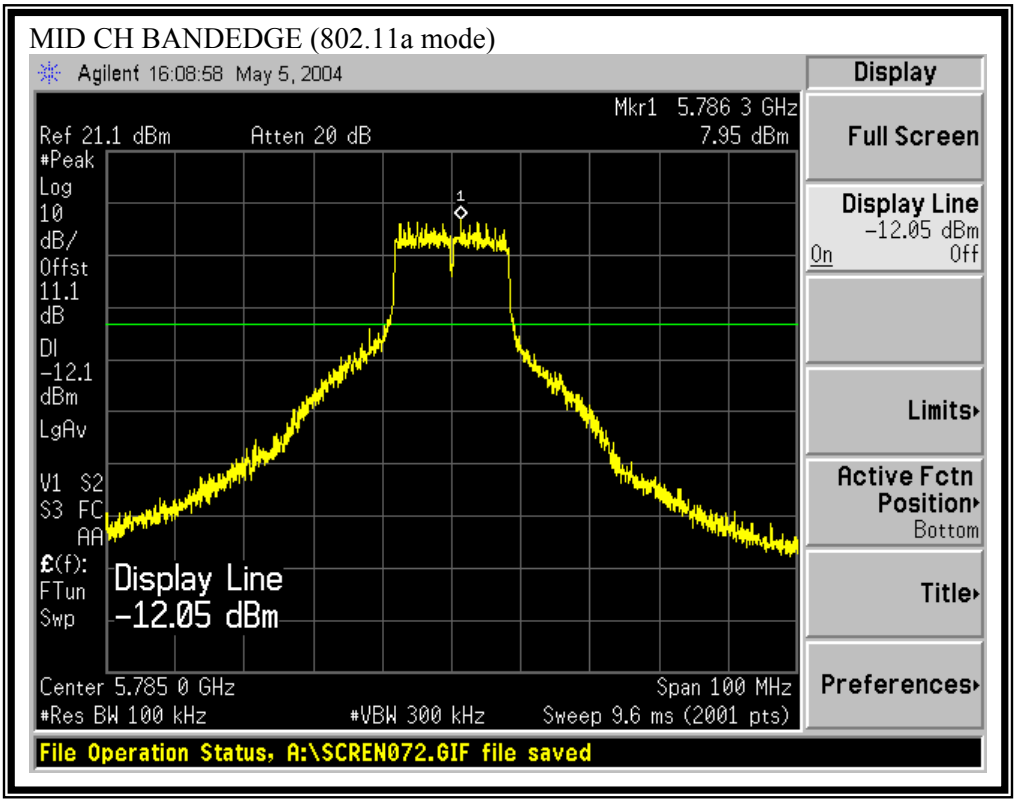


LOW CH SPURIOUS (802.11a mode)

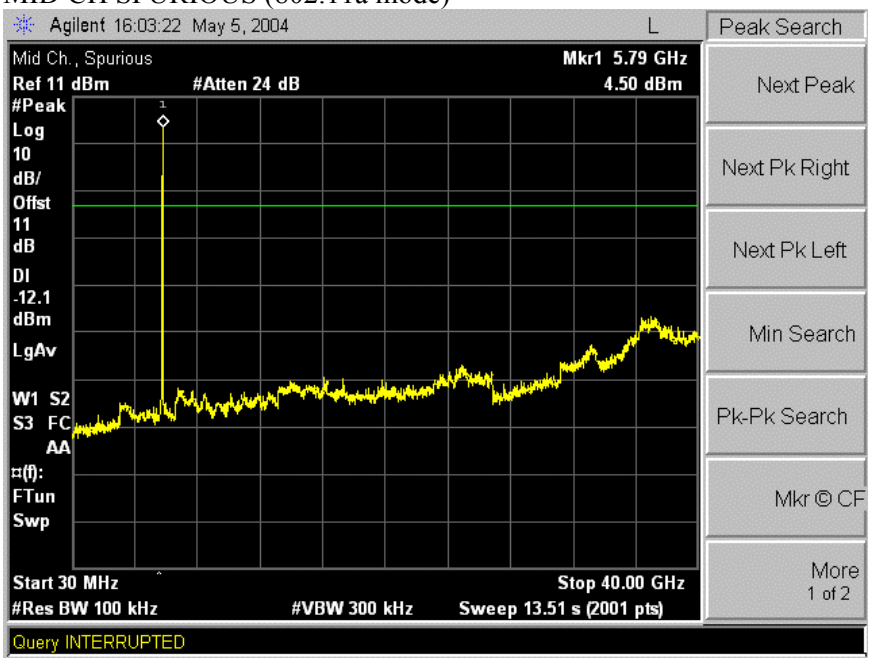


SPURIOUS EMISSIONS, MID CHANNEL (802.11a MODE)

MID CH BANDEDGE (802.11a mode)

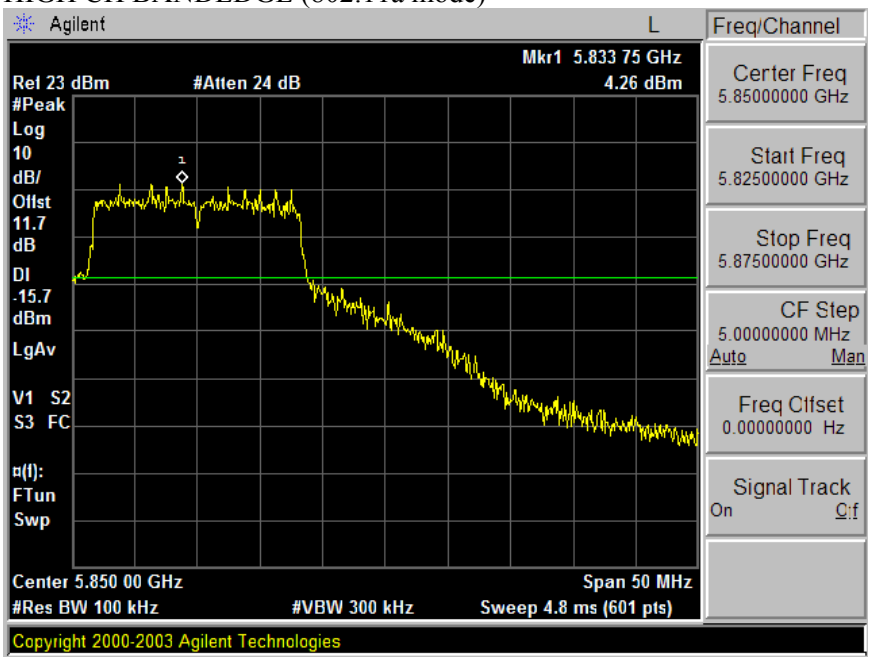


MID CH SPURIOUS (802.11a mode)

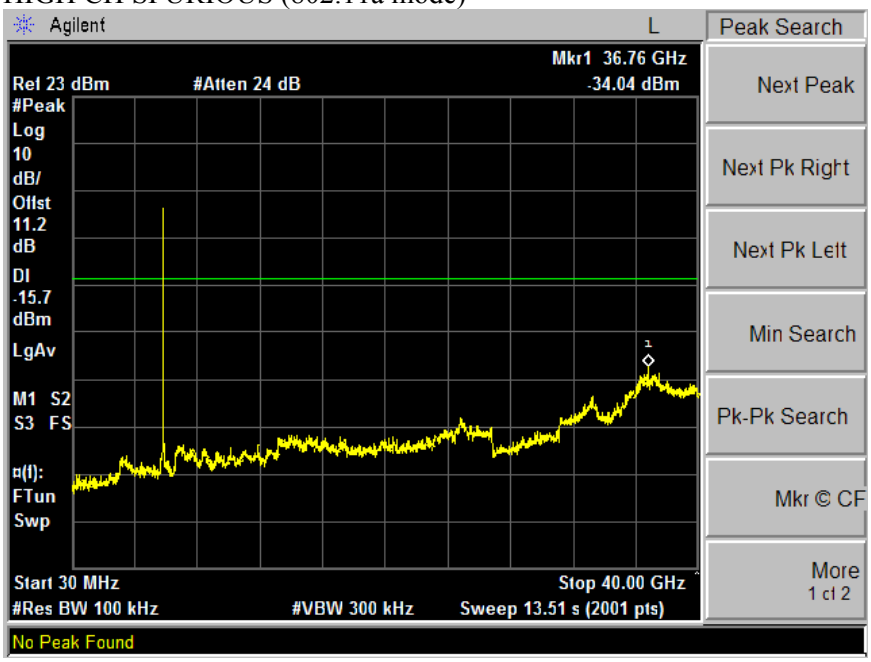


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11a MODE)

HIGH CH BANDEDGE (802.11a mode)



HIGH CH SPURIOUS (802.11a mode)



7.8. RADIATED EMISSIONS

7.8.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

LIMITS

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

RESULTS

No non-compliance noted:

For above 1GHz spurious, the worst-case (outdoor) has been reported.

TRANSMITTER RADIATED EMISSIONS ABOVE 1 GHZ

Low Channel

04/28/04 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill 5m chamber

Test Engr: Ben
Project #:04U2654-1
Company: SKYPILOT
EUT Descrip.:Fixed Wireless Subscriber Unit
EUT M/N: SO-1000
Test Target: FCC B
Mode Oper:Tx

Test Equipment:

EMCO Horn 1-18GHz	Spectrum Analyzer	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz
T120; S/N: 29310 @3m	Agilent E4446A Analyzer	T63 Miteq 646456		

Hi Frequency Cables
☐ (2 ft) ☐ (2 ~ 3 ft) ☑ (4 ~ 6 ft) ☑ (12 ft)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1 MHz Resolution Bandwidth
10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
Low Ch. 5745MHz ASB =2, RC=45															
11.490	9.8	39.3	28.3	39.0	5.3	-34.2	0.0	1.0	50.4	39.4	74.0	54.0	-23.6	-14.6	V
11.490	9.8	41.3	29.3	39.0	5.3	-34.2	0.0	1.0	52.4	40.4	74.0	54.0	-21.6	-13.6	H

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

Mid Channel

04/28/04 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill 5m chamber

Test Engr: Ben
Project #:04U2654-1
Company: SKYPILOT
EUT Descrip.:Fixed Wireless Subscriber Unit
EUT M/N: SO-1000
Test Target: FCC B
Mode Oper:Tx Mid Channel

Test Equipment:

EMCO Horn 1-18GHz	Spectrum Analyzer	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz
T120; S/N: 29310 @3m	Agilent E4446A Analyzer	T63 Miteq 646456		

Hi Frequency Cables
☐ (2 ft) ☐ (2 ~ 3 ft) ☑ (4 ~ 6 ft) ☑ (12 ft)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1 MHz Resolution Bandwidth
10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
Mid Ch. 5785MHz ASB =2, RC=45															
11.570	9.8	55.9	42.2	39.1	5.3	-34.3	0.0	1.0	67.1	53.4	74.0	54.0	-6.9	-0.6	H
11.570	9.8	48.2	35.1	39.1	5.3	-34.3	0.0	2.0	60.4	47.3	74.0	54.0	-13.6	-6.7	V

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

High Channel

09/28/04 **High Frequency Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: David Garcia
Project #: 04U2978-3
Company: Skypilot Network Inc.
EUT Descrip.: 802.11a fixed wireless subscriber unit
EUT M/N: RV7-SC1010 and RV7-SC1020
Test Target: FCC 15.407
Mode Oper: Transmitting
Outdoor version

Test Equipment:

EMCO Horn 1-18GHz: T73; S/N: 6717 @3m
Pre-amplifer 1-26GHz: T87 Miteq 924342
Pre-amplifer 26-40GHz:
Horn > 18GHz:

Hi Frequency Cables
2 foot cable:
3 foot cable: 3_David
4 foot cable:
12 foot cable: 12_Yan

HPF: HPF_7.6GHz
Reject Filter:

Peak Measurements
RBW=VBW=1MHz

Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
5835 Channel															
11.670	3.0	48.0	36.0	38.4	8.0	-38.8	0.0	0.7	56.3	44.3	74	54	-17.7	-9.7	V
11.670	3.0	50.5	36.5	38.4	8.0	-38.8	0.0	0.7	58.8	44.8	74	54	-15.2	-9.2	H
No further emissions detected.															

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

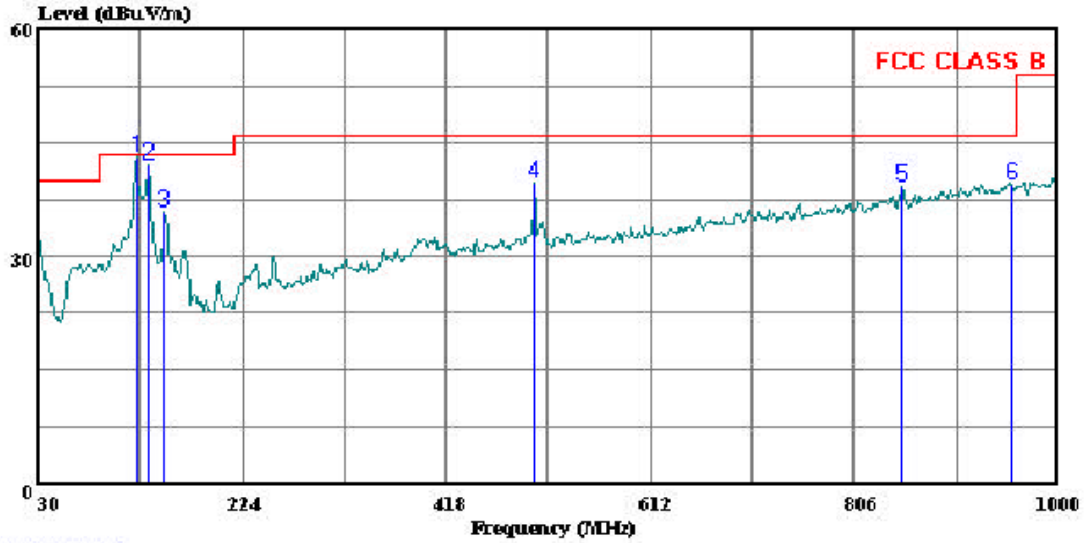
7.8.2. RADIATED EMISSIONS BELOW 1 GHZ FOR SC-1010 (INDOOR UNIT)

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 7 File#: 04U2654.EMI Date: 04-22-2004 Time: 10:16:07



(Audix ATC)

Trace: 6 Ref Trace:

Condition: FCC CLASS B HORIZONTAL
Test Operator: : Ben Du
Project #: : 04U2654
Company: : Skypilot Network
EUT: : 11a Fixed Wireless Subscriber Unit
Model No: : SI-1000
Configuration: : EUT and Laptop
Target of Test: : FCC Class B
Mode of Operation: Tx

HORIZONTAL DATA

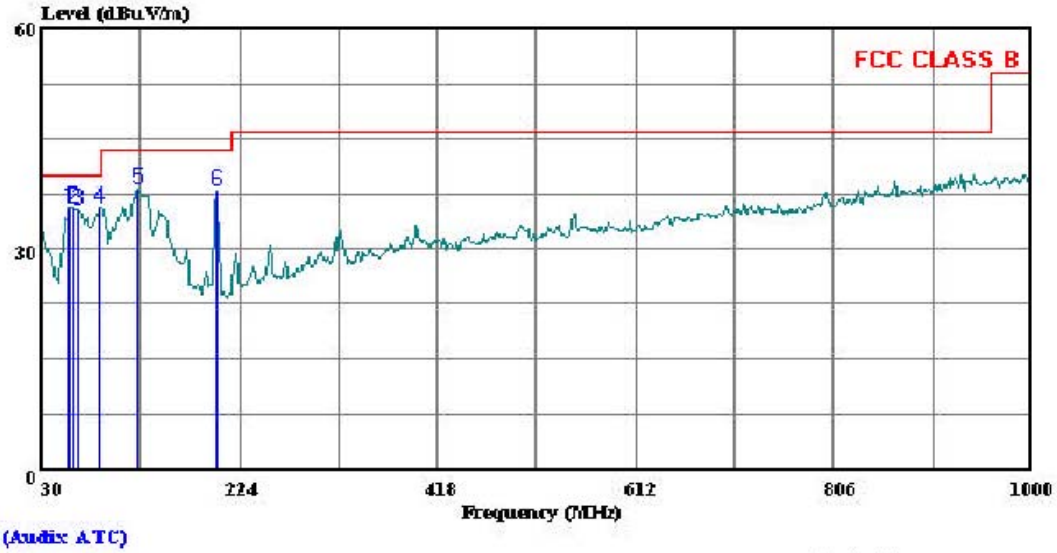
	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	124.090	Peak	27.69	15.36	43.05	43.50	-0.45
2	135.730	Peak	26.82	15.39	42.21	43.50	-1.29
3	150.280	Peak	21.44	14.28	35.72	43.50	-7.78
4	502.390	Peak	19.04	20.65	39.69	46.00	-6.31
5	851.590	Peak	13.66	25.52	39.18	46.00	-6.82
6	955.380	Peak	12.47	26.95	39.42	46.00	-6.58

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 9 File#: 04U2654.EMI Date: 04-22-2004 Time: 10:21:00



(Audix ATC)
Trace: 8 Ref Trace:

Condition: FCC CLASS B VERTICAL
Test Operator: : Ben Du
Project #: : 04U2654
Company: : Skypilot Network
EUT: : 11a Fixed Wireless Subscriber Unit
Model No: : SI-1000
Configuration: : EUT and Laptop
Target of Test: : FCC Class B
Mode of Operation: Tx

VERTICAL DATA

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	58.130	Peak	26.85	8.73	35.58	40.00	-4.42
2	61.040	Peak	26.65	8.90	35.55	40.00	-4.45
3	64.920	Peak	26.11	9.26	35.37	40.00	-4.63
4	87.230	Peak	26.66	9.00	35.66	40.00	-4.34
5	124.090	Peak	22.93	15.36	38.29	43.50	-5.21
6	201.690	Peak	24.14	13.78	37.92	43.50	-5.58

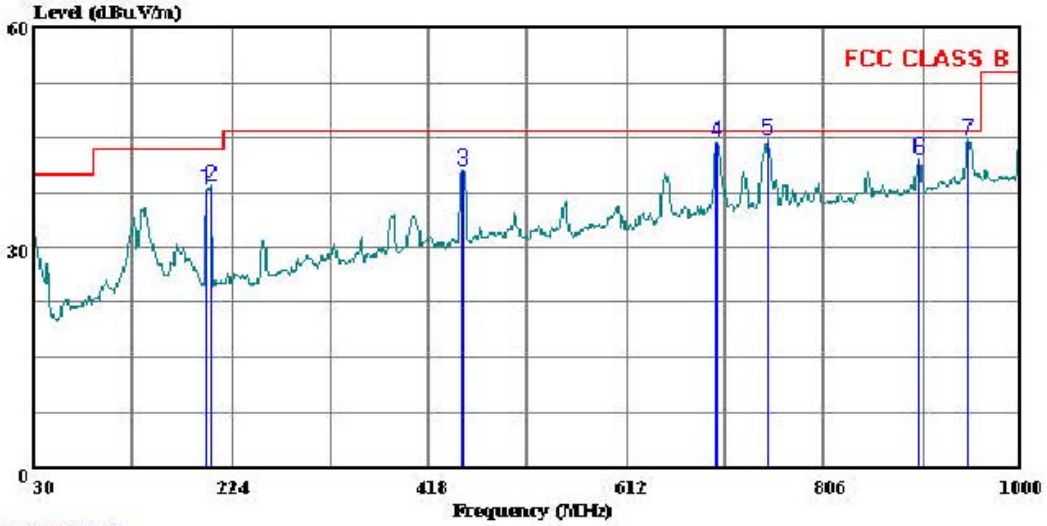
7.8.3. RADIATED EMISSIONS BELOW 1 GHZ FOR SC-1010 (OUTDOOR UNIT)

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 29 File#: 04u2654.emi Date: 05-06-2004 Time: 10:12:40



(Audix ATC)
Trace: 28 Ref Trace:

Condition: FCC CLASS B HORIZONTAL
Test Operator: : Ben Du
Project #: : 04U2654
Company: : Skypilot Network
EUT: : 11a Fixed Wireless Subscriber Unit
Model No: : SO-1000
Configuration: : EUT and Laptop
Target of Test: : FCC Class B
Mode of Operation: Tx, Big Chock on POE

HORIZONTAL DATA

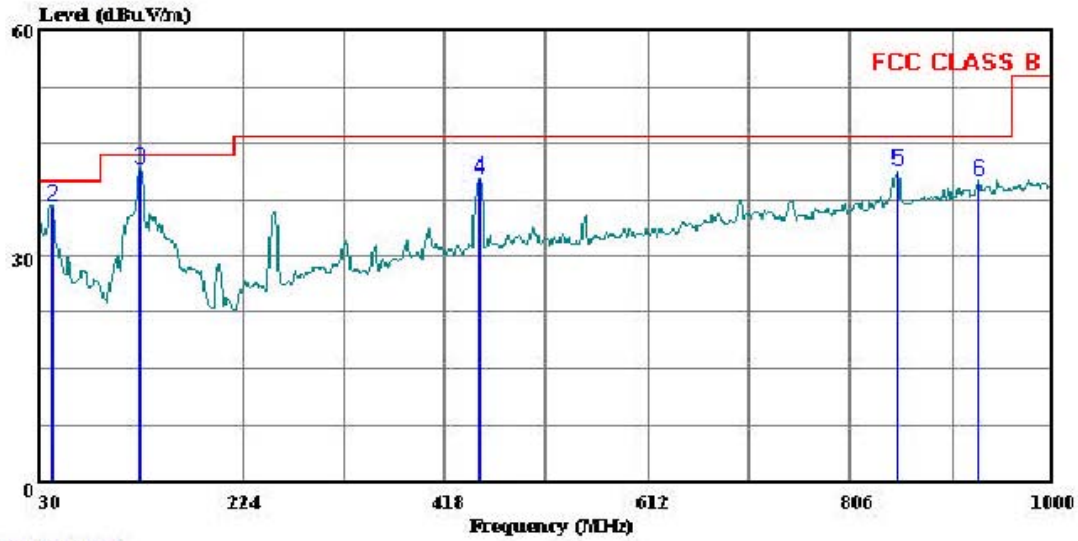
	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	200.720	Peak	24.12	13.78	37.90	43.50	-5.60
2	203.630	Peak	24.61	13.78	38.39	43.50	-5.11
3	450.980	Peak	20.99	19.44	40.43	46.00	-5.57
4	701.240	Peak	21.03	23.51	44.54	46.00	-1.46
5	749.740	Peak	20.49	24.31	44.80	46.00	-1.20
6	900.090	Peak	16.01	26.18	42.19	46.00	-3.82
7	948.590	Peak	17.69	26.88	44.57	46.00	-1.43

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 27 File#: 04u2654.emi Date: 05-06-2004 Time: 10:04:13



(Audix ATC)

Trace: 26 Ref Trace:

Condition: FCC CLASS B VERTICAL
Test Operator: : Ben Du
Project #: : 04U2654
Company: : Skypilot Network
EUT: : 11a Fixed Wireless Subscriber Unit
Model No: : SO-1000
Configuration: : EUT and Laptop
Target of Test: : FCC Class B
Mode of Operation: Tx, Big Chock on POE

VERTICAL DATA

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	30.970	Peak	11.55	22.95	34.50	40.00	-5.51
2	41.640	Peak	20.98	15.74	36.72	40.00	-3.28
3	126.030	Peak	26.10	15.48	41.58	43.50	-1.92
4	450.980	Peak	20.92	19.44	40.36	46.00	-5.64
5	851.590	Peak	15.65	25.52	41.17	46.00	-4.83
6	929.190	Peak	13.25	26.76	40.01	46.00	-5.99

7.9. POWERLINE CONDUCTED EMISSIONS

LIMIT

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

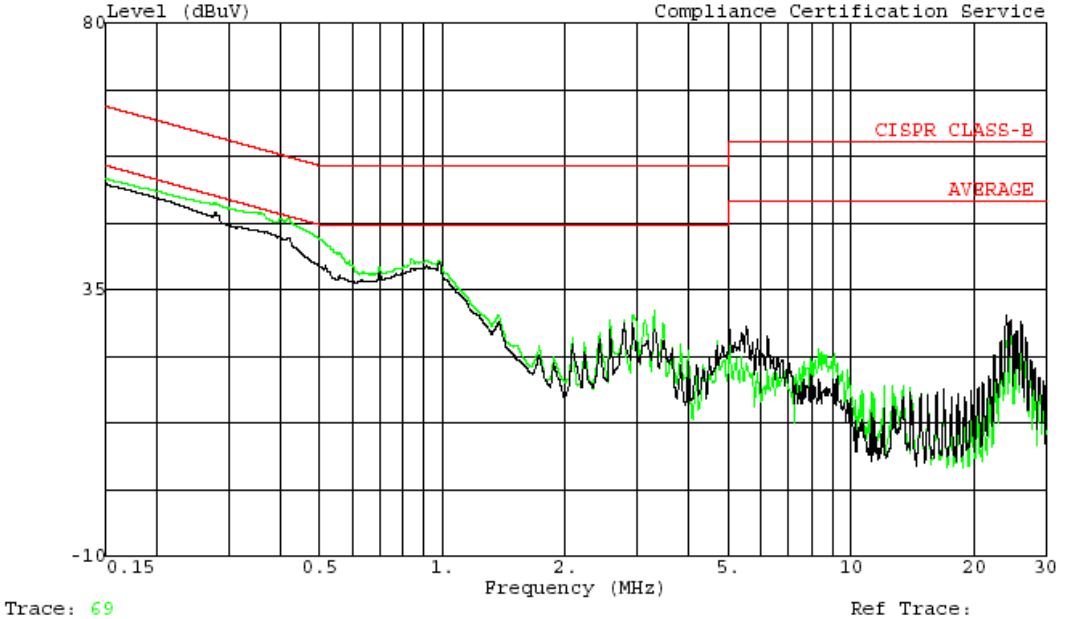
7.9.1. POWERLINE CONDUCTED EMISSIONS FOR SC-1010 (INDOOR UNIT)

6 WORST EMISSIONS

Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.15	53.80	--	--	0.00	66.00	56.00	-12.20	-2.20	L1
0.36	48.10	--	--	0.00	60.00	50.00	-11.90	-1.90	L1
0.42	46.87	--	--	0.00	58.26	48.26	-11.39	-1.39	L1
0.15	52.74	--	--	0.00	65.94	55.94	-13.20	-3.20	L2
0.30	47.83	--	--	0.00	61.80	51.80	-13.97	-3.97	L2
0.42	43.90	--	--	0.00	58.26	48.26	-14.36	-4.36	L2
6 Worst Data									

LINE 1 AND LINE 2 RESULTS

COMPLIANCE Engineering Services, Inc.
561F Monterey Road,
San Jose, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888



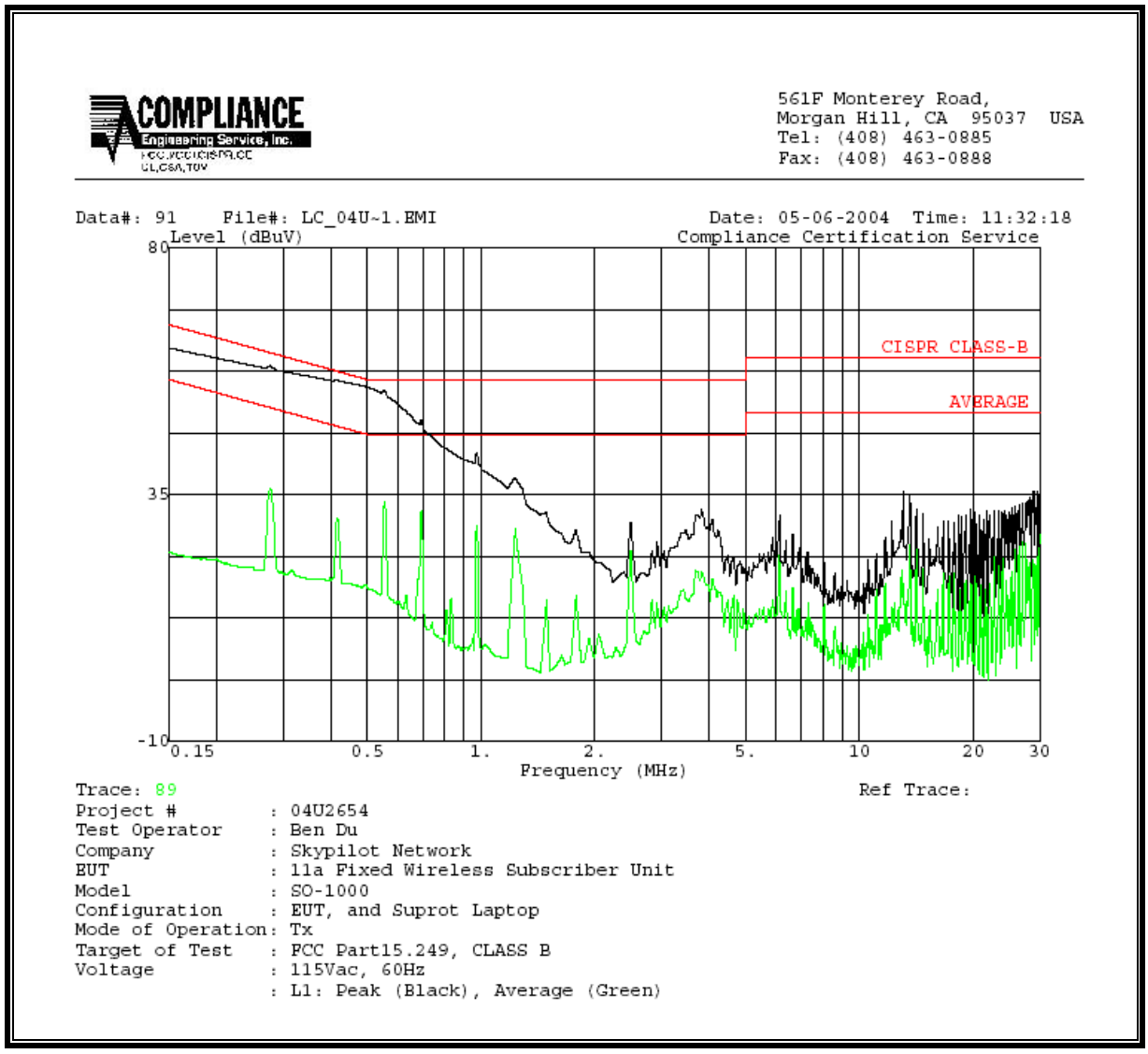
Trace: 69 Ref Trace:
Project # : 04U2654
Test Operator : Ben Du
Company : Skypilot Network
EUT : 11a Fixed Wireless Subscriber Unit
Model : SI-1000
Configuration : EUT, and Suprot Laptop
Mode of Operation: Tx
Target of Test : FCC Part15.249, CLASS B
Voltage : 115Vac, 60Hz
: Peak: L1 (Green), L2 (Black)

7.9.2. POWERLINE CONDUCTED EMISSIONS FOR SC-1010 (OUTDOOR UNIT)

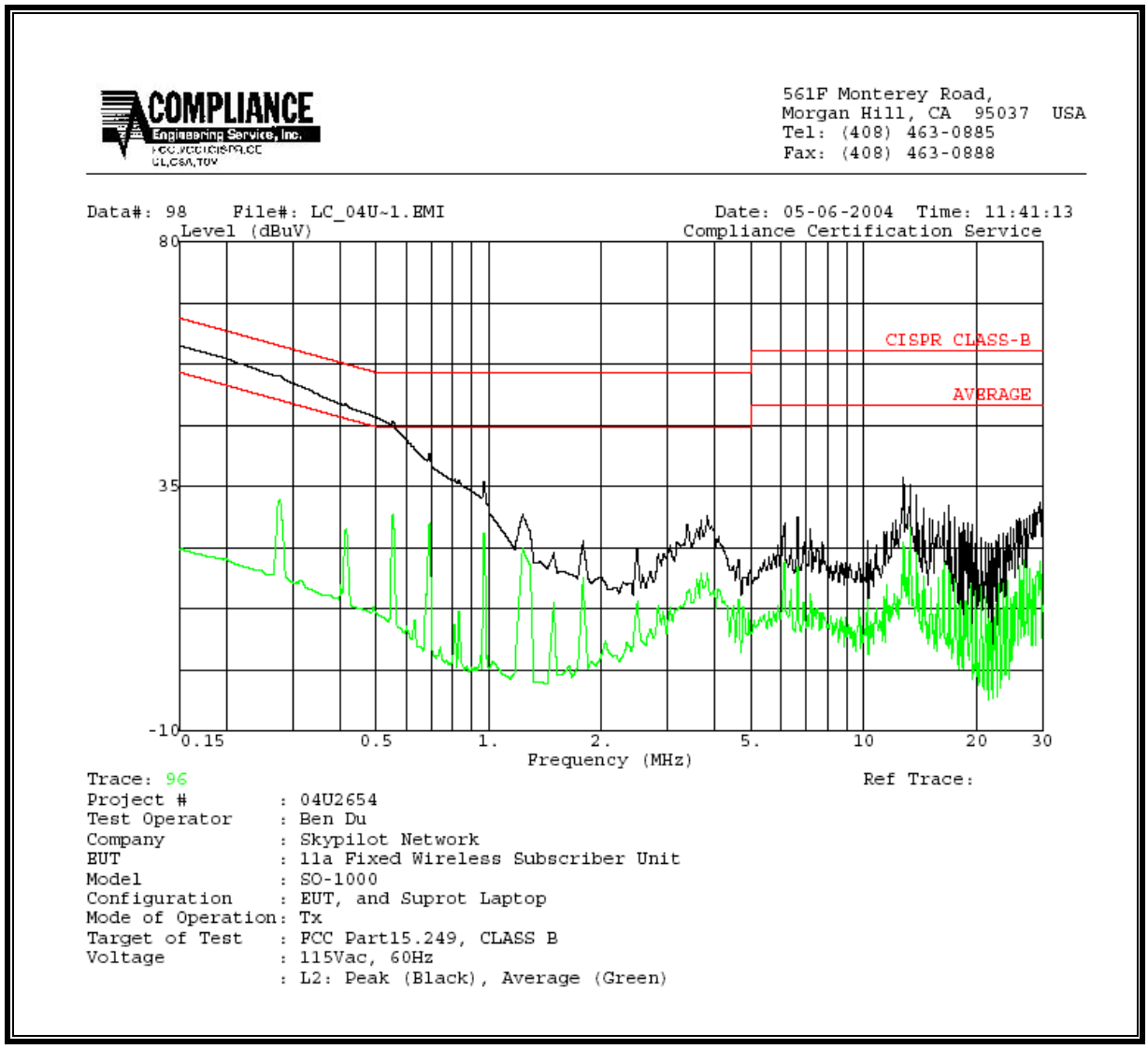
6 WORST EMISSIONS

Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.27	58.48	--	36.23	0.00	62.46	52.46	-3.98	-16.23	L1
0.47	55.16	--	30.77	0.00	56.83	46.83	-1.67	-16.06	L1
0.56	54.00	--	33.84	0.00	56.00	46.00	-2.00	-12.16	L1
0.16	60.55	--	23.57	0.00	65.83	55.83	-5.28	-32.26	L2
0.27	55.44	--	32.78	0.00	62.46	52.46	-7.02	-19.68	L2
0.56	47.06	--	29.97	0.00	56.00	46.00	-8.94	-16.03	L2
6 Worst Data									

LINE 1 RESULTS



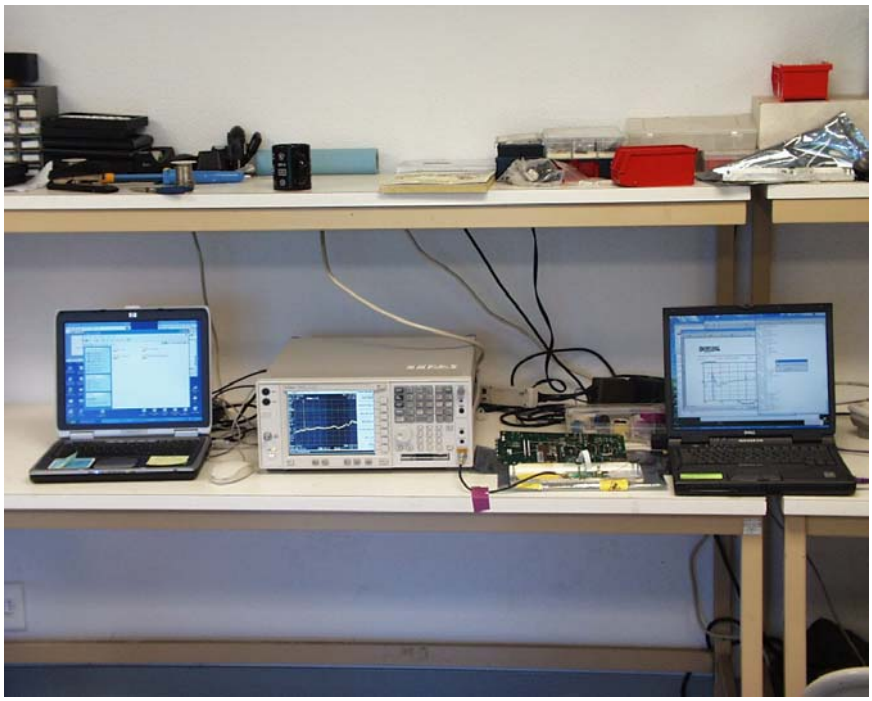
LINE 2 RESULTS



8. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

ANTENNA PORT CONDUCTED PHOTO



RADIATED RF MEASUREMENT SETUP

RADIATED FRONT PHOTO

RADIATED BACK PHOTO

DIGITAL DEVICE RADIATED EMISSIONS SETUP FOR SC-1010 (INDOOR UNIT)

DIGITAL DEVICE FRONT PHOTO

DIGITAL DEVICE BACK PHOTO

DIGITAL DEVICE RADIATED EMISSIONS SETUP FOR SC-1010 (OUTDOOR UNIT)

DIGITAL DEVICE FRONT PHOTO

DIGITAL DEVICE BACK PHOTO

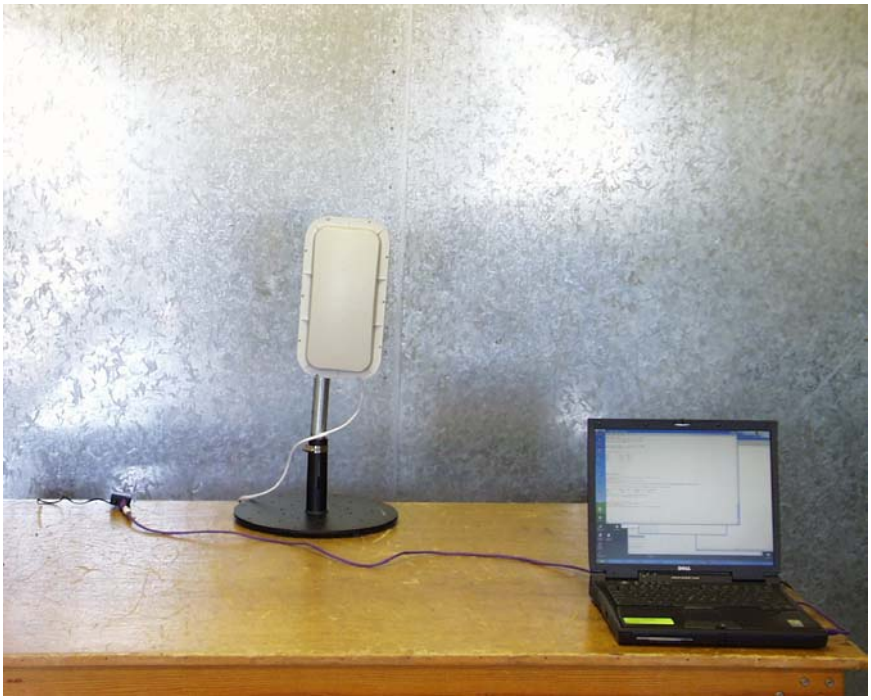
POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP FOR SC-1010 (INDOOR UNIT)

LINE CONDUCTED FRONT PHOTO

LINE CONDUCTED BACK PHOTO

POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP FOR SC-1010 (OUTDOOR UNIT)

LINE CONDUCTED FRONT PHOTO



LINE CONDUCTED BACK PHOTO

END OF REPORT