FCC Part 24
Transmitter Certification

Test Report

FCC ID: SO4YX500-PCS

FCC Rule Part: CFR 47 Part 24 Subpart E

ACS Report Number: 04-0364-24E

Manufacturer: Wireless Extenders
Equipment Type: PCS Band Bi-Directional Booster
Model: YX500-PCS

Test Begin Date: November 08, 2004
Test End Date: December 3, 2004

Report Issue Date: December 6, 2004

FOR THE SCOPE OF ACCREDITATION UNDER LAB Code 200612

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1.0 GENERAL

1.1 Purpose
The purpose of this report is to demonstrate compliance with Part 2 Subpart J and Part 24 Subpart E of the FCC's Code of Federal Regulations.

1.2 Product Description
The YX500-PCS is a Bi-Directional Amplifier (BDA) system which captures the signal arriving outside a consumer's home and amplifies it inside the home, as well as capturing the signal from the user's phone and amplifying it to the outdoor network. The YX500-PCS handles all applicable air-interface protocols including TDMA, GSM, and CDMA. It includes multiple patent pending technologies to prevent interference. The combination of low gain and low NF means that it will not raise the BTS's Noise Floor and the YX500-PCS has a signal delay similar to multipath making it transparent to the wireless network.

Detailed photographs of the EUT are filed separately with this filing.

1.3 Technical Specifications

Table 1.3-1: Specifications

Frequency	1850 – 1990 MHz (PCS only)
Networks	CDMA, GSM, and TDMA
Total Signal Gain	60dB (adaptive)
Power Input	100 – 120 VAC 60Hz
Power Output	5VDC, 2.0A
Signal Antenna Cable	Outdoor rated 75Ω DBS satellite coaxial cable, F male

1.4 EUT Operating Configuration and Test Conditions
The EUT was configured and tested utilizing the maximum input drive level resulting in maximum gain conditions for all tests. If the maximum input drive level is exceeded, internal attenuators are activated to produce a level RF output and eliminate the device from operating beyond the maximum RF output power that is below the saturated RF output power. The detected power levels are monitored by a microcontroller. The microcontroller limits the maximum output power to keep the amplifiers linear without interfering with the network power control.

2.0 LOCATION OF TEST FACILTY
All testing was performed by qualified ACS personnel located at the following address:

ACS, Inc.
5015 B.U. Bowman Drive
Buford, GA 30518

2.1 DESCRIPTION OF TEST FACILITY
Both the Open Area Test Site (OATS) and Conducted Emissions site have been fully described, submitted to, and accepted by the FCC, Industry Canada, and the Japanese Voluntary Control Council for Interference by information technology equipment.

The following certification numbers have been issued in recognition of these accreditations and certifications:

FCC Registration Number: 89450
Industry Canada Lab Code: IC 4175
VCCI Member Number: 1831
- VCCI OATS Registration Number R-1526
- VCCI Conducted Emissions Site Registration Number: C-1608

2.1.1 Open Area Test Site

The open area test site consists of a 40' x 66' concrete pad covered with a perforated electro-plated galvanized sheet metal. The perforations in the sheet metal are 1/8" holes that are staggered every 3/16". The individual sheets are placed to overlap each other by 1/4" and are riveted together to provide a continuous seam. Rivets are spaced every 3" in a 3 x 20 meter perimeter around the antenna mast and EUT area. Rivets in the remaining area are spaced as necessary to properly secure the ground plane and maintain the electrical continuity.

The entire ground plane extends 12' beyond the turntable edge and 16' beyond the antenna mast when set to a 10 meter measurement distance. The ground plane is grounded via 4 - 8' copper ground rods, each installed at a corner of the ground plane and bound to the ground plane using 3/4" stainless steel braided cable.

The turntable is an all aluminum 10' flush mounted table installed in an all aluminum frame. The table is remotely operated from inside the control room located 40' from the range. The turntable is electrically bonded to the surrounding ground plane via steel fingers installed on the edge of the turn table. The steel fingers make constant contact with the ground plane during operation.

Adjacent to the turntable is a 7' x 7' square and 4' deep concrete pit used for support equipment if necessary. The pit is equipped with 5 - 4" PVC chases from the pit to the control room that allow for cabling to the EUT if necessary. The underside of the turntable can be accessed from the pit so cables can be supplied to the EUT from the pit. The pit is covered with 2 sheets of 1/4" diamond style re-enforced steel sheets. The sheets are painted to match the perforated steel ground plane; however the underside edges have been masked off to maintain the electrical continuity of the ground plane. All reflecting objects are located outside of the ellipse defined in ANSI C63.4.

A diagram of the Open Area Test Site is shown in Figure 2.1-1 below:

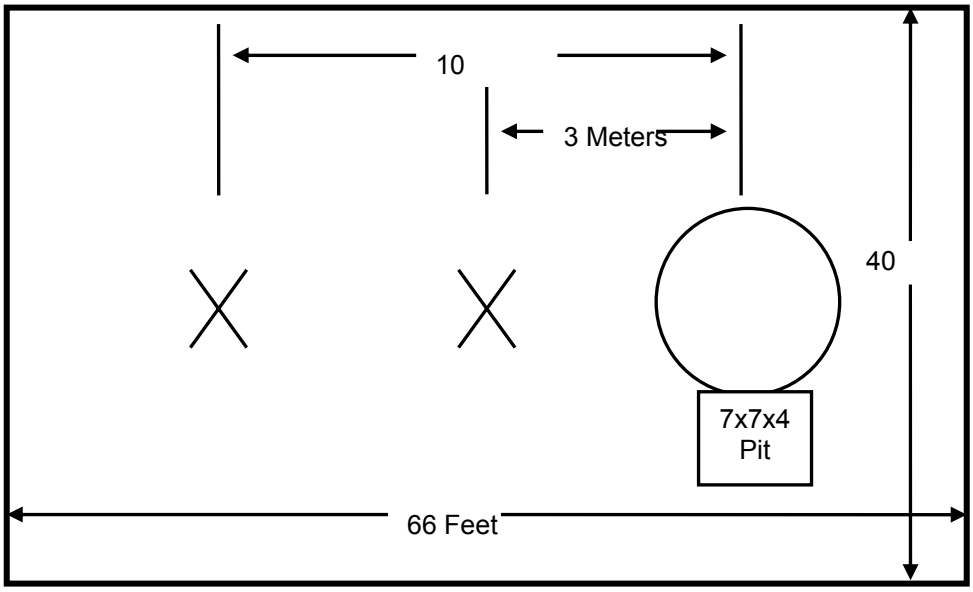

Figure 2.1-1: Open Area Test Site

2.1.2 Conducted Emissions Test Site Description

The AC mains conducted EMI site is a shielded room with the following dimensions:

- Height: 3.0 Meters
- Width: 3.6 Meters
- Length: 4.9 Meters

The room is manufactured by Rayproof Corporation and installed by Panashield, Inc. Earth ground is provided to the room via an 8' copper ground rod. Each panel of the room is connected electrically at intervals of 4".

Power to the room is filtered to prevent ambient noise from coupling to the EUT and measurement equipment. Filters are models 1B42-60P manufactured by Rayproof Corporation.

The room is of sufficient size to test table top and floor standing equipment in accordance with section 6.1.4 of ANSI C63.4.

A diagram of the room is shown below in figure 2.1-2:

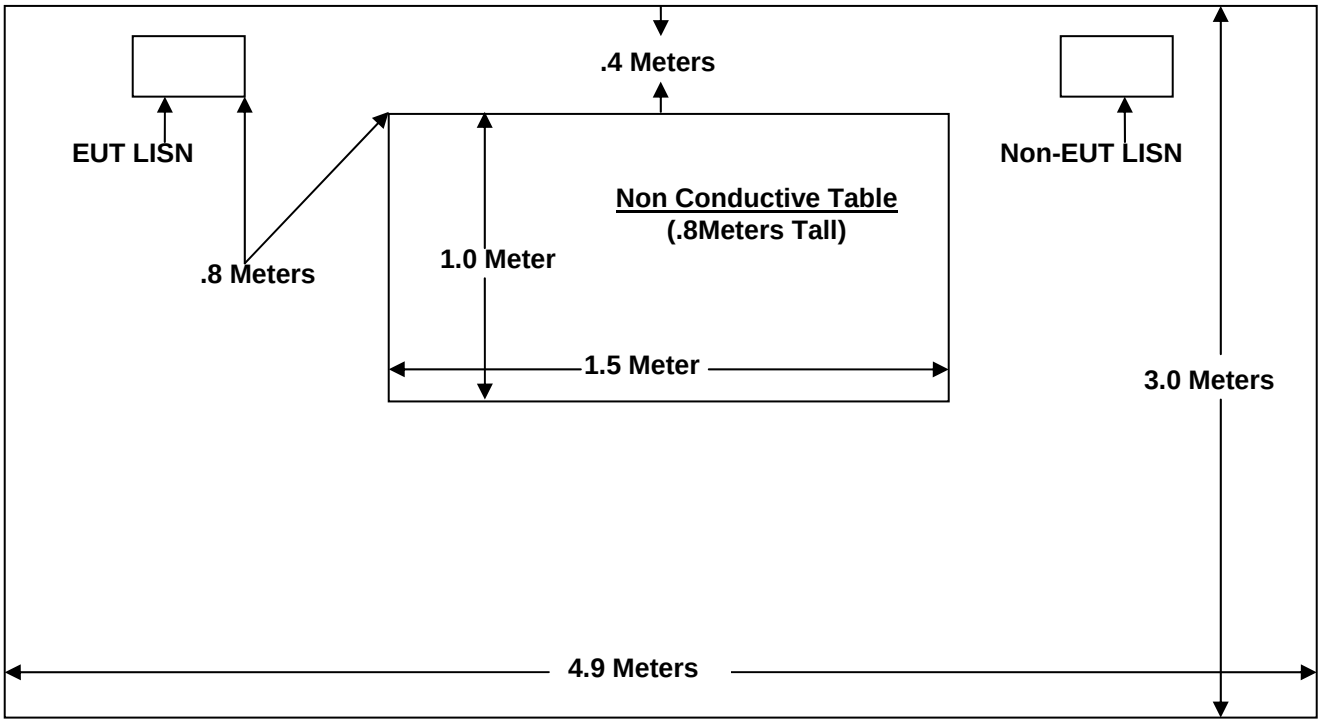

Figure 2.1-2: AC Mains Conducted EMI Site

3.0 APPLICABLE STANDARD REFERENCES

The following standards were used:

1 - ANSI C63.4-1992: Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the 9KHz to 40GHz

2 - US Code of Federal Regulations (CFR): Title 47, Part 2, Subpart J: Equipment Authorization Procedures (October 2003)

3 - US Code of Federal Regulations (CFR): Title 47, Part 24, Subpart E: Personal Communication Service, Broadband PCS (October 2003)

4.0 LIST OF TEST EQUIPMENT

All test equipment used for regulatory testing is calibrated yearly or according to manufacturer's specifications.

Table 4-1: Test Equipment

Equipment Calibration Information					
ACS#	**Mfg.**	**Eq. type**	**Model**	**S/N**	**Cal. Due**
---	Agilent	Spectrum Analyzer	E7402A	US40240259	02/26/05
26	Chase	Bi-Log Antenna	CBL6111	1044	10/11/05
152	EMCO	LISN	3825/2	9111-1905	01/08/05
153	EMCO	LISN	3825/2	9411-2268	12/11/04
193	ACS	OATS Cable Set	RG8	193	01/09/05
167	ACS	Conducted EMI Cable Set	RG8	167	01/09/05
22	Agilent	Pre-Amplifier	8449B	3008A00526	05/12/05
73	Agilent	Pre-Amplifier	8447D	272A05624	04/30/05
30	Spectrum Technologies	Horn Antenna	DRH-0118	970102	05/08/05
105	Microwave Circuits	High Pass Filter	H1G810G1	2123-01 DC0225	06/09/05
209	Microwave Circuits	High Pass Filters	H3G020G2	4382-01 DC0421	06/09/05
1	Rohde & Schwarz	Receiver	804.8932.52	833771/007	02/26/05
2	Rohde & Schwarz	Receiver	1032.5640.53	839587/003	02/26/05
3	Rohde & Schwarz	ESMI Receiver	804.8932.52	839379/011	*
4	Rohde & Schwarz	ESMI Receiver	1032.5640.53	833827/003	*
213	Test Equipment Corp.	Pre-Amplifier	PA-102	44927	06/28/05
211	Eagle	Band Reject Filter	C7RFM3NFNM	n/a	06/28/05
168	Hewlett Packard	Pulse Limiter	11947A	3107A02268	04/30/05
93	Chase	EM Clamp	CIC 8101	65	01/12/05
184	ACS	Cable	RG8	184	01/09/05
169	Solar Electronics	LISN	9117-5-TS-50-N	031032	04/12/05
6	Harbour Industries	HF RF Cable	LL-335	00006	03/15/05
7	Harbour Industries	HF RF Cable	LL-335	00007	03/15/05
208	n/a	HF RF Cable	n/a	00208	06/14/05
5	ChaseRF Current Probe	Current Probe	CSP-8441	19	01/23/05
196	Cell Antenna	3 Way Pwr Divider	CAP310	NA	NA
--	Agilent	Signal Generator	ESG-D E4432B	US38330716	04/15/06
--	Agilent	Signal Generator	ESG-D E4432B	US40053553	03/10/05

* Note: No calibration required – used for pre-scan data only

5.0 SUPPORT EQUIPMENT

Table 5-1: Support Equipment

Diagram #	Manufacturer	Equipment Type	Model Number	Serial Number	FCC ID
1	Fairway Electronic Co.	100-120V / 50-60 Hz Power Supply	WT10L-050	NA	NA

6.0 EQUIPMENT UNDER TEST SETUP AND BLOCK DIAGRAM

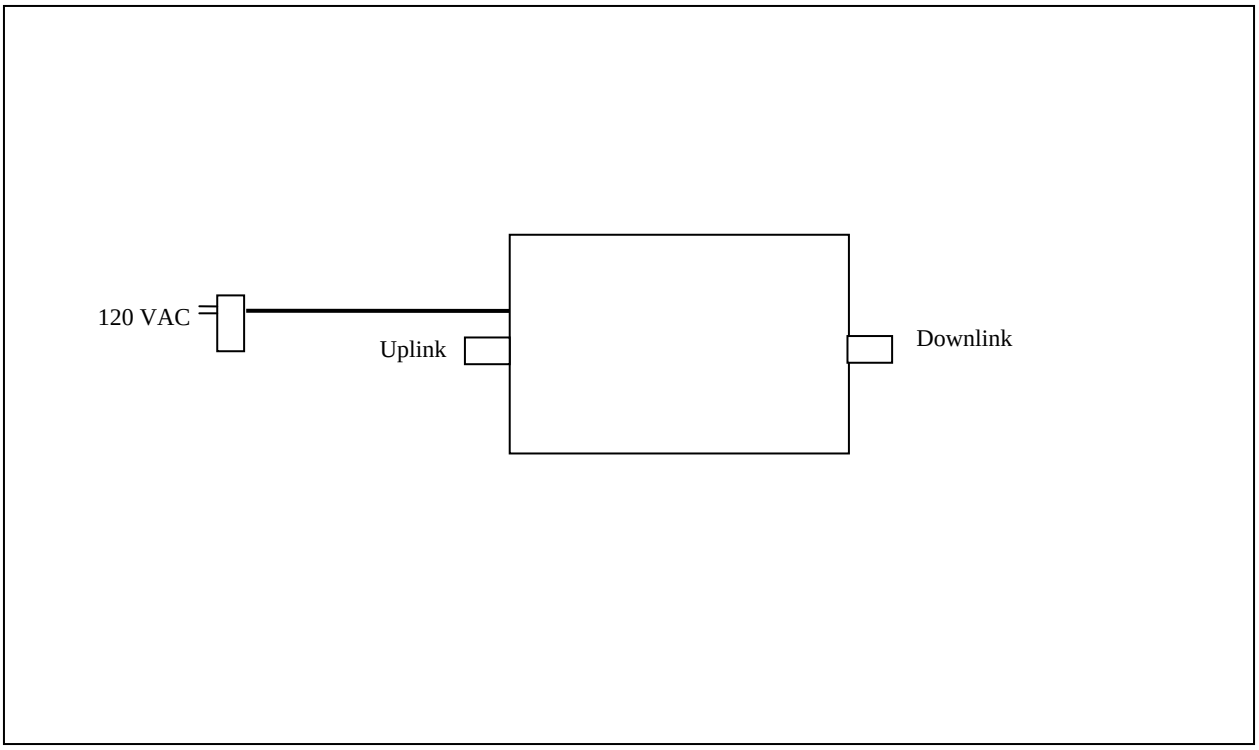

Figure 6-1: EUT Test Setup

7.0 SUMMARY OF TESTS

Along with the tabular data shown below, plots were taken of all signals deemed important enough to document. Data plots can be found in the test report appendix 04-0364-24E-A.

7.1 RF Power Output - FCC Section 2.1046

7.1.1 Measurement Procedure

The RF output of the equipment under test was directly connected to the input of the Spectrum Analyzer. The resolution and video bandwidths of the spectrum analyzer were set at sufficient levels, >> emission bandwidth, to produce accurate results. The analyzer was set for Max Hold using a peak detector. Results for uplink and downlink configurations for CDMA, TDMA and GSM modulation are shown below in Table 7.1-1.

7.1.2 Measurement Results

Peak output power plots are listed below and are supplied in the test report appendix 04-0364-24E-A.

Table 7.1-1: Peak Output Power

Configuration	Modulation	Channel	Frequency (MHz)	RF Power Output (dBm)	Plot Reference
Uplink	CDMA	Low	1851.25	22.39	Figure 1.
Uplink	CDMA	Middle	1880.00	21.14	Figure 2.
Uplink	CDMA	High	1908.75	20.36	Figure 3.
Uplink	TDMA	Low	1850.03	23.66	Figure 4.
Uplink	TDMA	Middle	1878.98	23.22	Figure 5.
Uplink	TDMA	High	1909.97	21.47	Figure 6.
Uplink	GSM	Low	1850.20	22.39	Figure 7.
Uplink	GSM	Middle	1880.00	23.56	Figure 8.
Uplink	GSM	High	1909.80	21.40	Figure 9.
Downlink	CDMA	Low	1931.25	13.50	Figure 10.
Downlink	CDMA	Middle	1960.00	15.79	Figure 11.
Downlink	CDMA	High	1988.75	15.64	Figure 12.
Downlink	TDMA	Low	1930.03	6.72	Figure 13.
Downlink	TDMA	Middle	1958.98	8.50	Figure 14.
Downlink	TDMA	High	1989.97	9.95	Figure 15.
Downlink	GSM	Low	1930.20	4.67	Figure 16.
Downlink	GSM	Middle	1960.00	6.22	Figure 17.
Downlink	GSM	High	1989.8	6.93	Figure 18.

7.2 Occupied Bandwidth (Emission Limits) - FCC Section 2.1049, 24.238

7.2.1 Measurement Procedure

The RF output of the equipment under test was directly connected to the input of the Spectrum Analyzer. The spectrum analyzer resolution and video bandwidths were set to 1% the emission bandwidth. The analyzer was set for Max Hold using a peak detector. Both the input and output bandwidths were evaluated to show similar characteristics of the emissions. Results for uplink and downlink configurations for CDMA, TDMA and GSM modulation are shown below in Table 7.2-1.

7.2.2 Measurement Results

Occupied bandwidth plots are listed below and are supplied in the test report appendix 04-0364-24E-A.

Table 7.2-1: Occupied Bandwidth

Configuration	Modulation	Channel	Frequency (MHz)	Plot Reference
Uplink - Input	CDMA	Low	1851.25	Figure 19.
Uplink - Output	CDMA	Low	1851.25	Figure 20.
Uplink - Input	CDMA	Middle	1880.00	Figure 21.
Uplink - Input	CDMA	Middle	1880.00	Figure 22.
Uplink - Output	CDMA	High	1908.75	Figure 23.
Uplink - Input	CDMA	High	1908.75	Figure 24.
Uplink - Output	TDMA	Low	1850.03	Figure 25.
Uplink - Input	TDMA	Low	1850.03	Figure 26.
Uplink - Output	TDMA	Middle	1878.98	Figure 27.
Uplink - Input	TDMA	Middle	1878.98	Figure 28.
Uplink - Output	TDMA	High	1909.97	Figure 29.
Uplink - Input	TDMA	High	1909.97	Figure 30.
Uplink - Output	GSM	Low	1850.20	Figure 31.
Uplink - Input	GSM	Low	1850.20	Figure 32.
Uplink - Output	GSM	Middle	1880.00	Figure 33.
Uplink - Input	GSM	Middle	1880.00	Figure 34.
Uplink - Output	GSM	High	1909.80	Figure 35.
Uplink - Input	GSM	High	1909.80	Figure 36.
Downlink - Input	CDMA	Low	1931.25	Figure 37.
Downlink - Output	CDMA	Low	1931.25	Figure 38.
Downlink - Input	CDMA	Middle	1960.00	Figure 39.
Downlink - Output	CDMA	Middle	1960.00	Figure 40.
Downlink - Input	CDMA	High	1988.75	Figure 41.
Downlink - Output	CDMA	High	1988.75	Figure 42.
Downlink - Input	TDMA	Low	1930.03	Figure 43.
Downlink - Output	TDMA	Low	1930.03	Figure 44.
Downlink - Input	TDMA	Middle	1958.98	Figure 45.
Downlink - Output	TDMA	Middle	1958.98	Figure 46.
Downlink - Input	TDMA	High	1989.97	Figure 47.
Downlink - Output	TDMA	High	1989.97	Figure 48.
Downlink - Input	GSM	Low	1930.20	Figure 49.
Downlink - Output	GSM	Low	1930.20	Figure 50.
Downlink - Input	GSM	Middle	1960.00	Figure 51.
Downlink - Output	GSM	Middle	1960.00	Figure 52.
Downlink - Input	GSM	High	1989.8	Figure 53.
Downlink - Output	GSM	High	1989.8	Figure 54.

7.3 Spurious Emissions at Antenna Terminals - FCC Section 2.1051, 24.238

7.3.1 Measurement Procedure

The RF output of the equipment under test was directly connected to the input of the Spectrum Analyzer. The spectrum analyzer resolution and video bandwidths were set to 1 MHz according to Section 24.238 (b). The spectrum was investigated for the 30 MHz to 20 GHz in accordance to CFR 47 Part 2.1057. The analyzer was set for Max Hold using a peak detector. Data was collected for both uplink and downlink configurations for CDMA, TDMA and GSM modulations.

7.3.2 Measurement Results

Emission plots are listed below and are supplied in the test report appendix 04-0364-24E-A.

Table 7.3-1: Spurious Emissions

Configuration	Modulation	Channel	Frequency Range (MHz)	Plot Reference
Uplink	CDMA	Low	30 – 2900	Figure 55.
Uplink	CDMA	Low	2900 - 20000	Figure 56.
Uplink	CDMA	Middle	30 – 2900	Figure 57.
Uplink	CDMA	Middle	2900 - 20000	Figure 58.
Uplink	CDMA	High	30 – 2900	Figure 59.
Uplink	CDMA	High	2900 - 20000	Figure 60.
Uplink	TDMA	Low	30 – 2900	Figure 61.
Uplink	TDMA	Low	2900 - 20000	Figure 62.
Uplink	TDMA	Middle	30 – 2900	Figure 63.
Uplink	TDMA	Middle	2900 - 20000	Figure 64.
Uplink	TDMA	High	30 – 2900	Figure 65.
Uplink	TDMA	High	2900 - 20000	Figure 66.
Uplink	GSM	Low	30 – 2900	Figure 67.
Uplink	GSM	Low	2900 - 20000	Figure 68.
Uplink	GSM	Middle	30 – 2900	Figure 69.
Uplink	GSM	Middle	2900 - 20000	Figure 70.
Uplink	GSM	High	30 – 2900	Figure 71.
Uplink	GSM	High	2900 - 20000	Figure 72.
Downlink	CDMA	Low	30 – 2900	Figure 73.
Downlink	CDMA	Low	2900 - 20000	Figure 74.
Downlink	CDMA	Middle	30 – 2900	Figure 75.
Downlink	CDMA	Middle	2900 - 20000	Figure 76.
Downlink	CDMA	High	30 – 2900	Figure 77.
Downlink	CDMA	High	2900 - 20000	Figure 78.
Downlink	TDMA	Low	30 – 2900	Figure 79.
Downlink	TDMA	Low	2900 - 20000	Figure 80.
Downlink	TDMA	Middle	30 – 2900	Figure 81.
Downlink	TDMA	Middle	2900 - 20000	Figure 82.
Downlink	TDMA	High	30 – 2900	Figure 83.
Downlink	TDMA	High	2900 - 20000	Figure 84.
Downlink	GSM	Low	30 – 2900	Figure 85.
Downlink	GSM	Low	2900 - 20000	Figure 86.
Downlink	GSM	Middle	30 – 2900	Figure 87.
Downlink	GSM	Middle	2900 - 20000	Figure 88.
Downlink	GSM	High	30 – 2900	Figure 89.
Downlink	GSM	High	2900 - 20000	Figure 90.

7.4 Band-edge Compliance - FCC Section 24.238

7.4.1 Measurement Procedure

The RF output of the equipment under test was directly connected to the input of the Spectrum Analyzer. The spectrum analyzer resolution and video bandwidths were set to 1% the emission bandwidth. The analyzer was set for Max Hold using a peak detector. The center frequency was set to both the upper and lower PCS frequency block edges. Uplink and downlink configurations for CDMA, TDMA and GSM modulations were evaluated.

7.4.2 Measurement Results

Band-edge plots in are listed in Table 7.4-1below and are supplied in the test report appendix 04-0364-24E-A.

Table 7.3-1: Band-edge

Configuration	Modulation	Channel	Frequency (MHz)	Plot Reference
Uplink	CDMA	Low	1851.25	Figure 91.
Uplink	CDMA	High	1908.75	Figure 92.
Uplink	TDMA	Low	1850.03	Figure 93.
Uplink	TDMA	High	1909.97	Figure 94.
Uplink	GSM	Low	1850.20	Figure 95.
Uplink	GSM	High	1909.80	Figure 96.
Downlink	CDMA	Low	1931.25	Figure 97.
Downlink	CDMA	High	1988.75	Figure 98.
Downlink	TDMA	Low	1930.03	Figure 99.
Downlink	TDMA	High	1989.97	Figure 100.
Downlink	GSM	Low	1930.20	Figure 101.
Downlink	GSM	High	1989.8	Figure 102.

7.5 Intermodulation Products

7.5.1 Measurement Procedure

The RF output of the equipment under test was directly connected to the input of the Spectrum Analyzer. The two tone two test method was used with the device operating at maximum drive levels. Two tones were placed at both lower and upper band-edges and adjusted such that the third order harmonics were maximized and within the operating frequency band.

For in band measurements the spectrum analyzer resolution and video bandwidths were set to 1% the emission bandwidth. For out of band emissions the spectrum analyzer resolution and video bandwidths were set to 1 MHz and the frequency range was evaluated from 30 MHz to 20 GHz. The analyzer was set for Max Hold using a peak detector. Data was collected at the lower band-edge and upper band-edge for uplink and downlink configurations and for CDMA, TDMA and GSM modulations.

7.5.2 Measurement Results

Intermodulation plots are listed below and are supplied in the test report appendix 04-0364-24E-A.

Table 7.5-1: Intermodulation

Configuration	Modulation	Band-edge	Frequency Range (MHz)	Plot Reference
Uplink	CDMA	Low	In Band	Figure 103.
Uplink	CDMA	Low	30 – 2900	Figure 104.
Uplink	CDMA	Low	2900 - 20000	Figure 105.
Uplink	CDMA	High	In Band	Figure 106.
Uplink	CDMA	High	30 – 2900	Figure 107.
Uplink	CDMA	High	2900 - 20000	Figure 108.
Uplink	TDMA	Low	In Band	Figure 109.
Uplink	TDMA	Low	30 – 2900	Figure 110.
Uplink	TDMA	Low	2900 - 20000	Figure 111.
Uplink	TDMA	High	In Band	Figure 112.
Uplink	TDMA	High	30 – 2900	Figure 113.
Uplink	TDMA	High	2900 - 20000	Figure 114.
Uplink	GSM	Low	In Band	Figure 115.
Uplink	GSM	Low	30 – 2900	Figure 116.
Uplink	GSM	Low	2900 - 20000	Figure 117.
Uplink	GSM	High	In Band	Figure 118.
Uplink	GSM	High	30 – 2900	Figure 119.
Uplink	GSM	High	2900 - 20000	Figure 120.
Downlink	CDMA	Low	In Band	Figure 121.
Downlink	CDMA	Low	30 – 2900	Figure 122.
Downlink	CDMA	Low	2900 - 20000	Figure 123.
Downlink	CDMA	High	In Band	Figure 124.
Downlink	CDMA	High	30 – 2900	Figure 125.
Downlink	CDMA	High	2900 - 20000	Figure 126.
Downlink	TDMA	Low	In Band	Figure 127.
Downlink	TDMA	Low	30 – 2900	Figure 128.
Downlink	TDMA	Low	2900 - 20000	Figure 129.
Downlink	TDMA	High	In Band	Figure 130.
Downlink	TDMA	High	30 – 2900	Figure 131.
Downlink	TDMA	High	2900 - 20000	Figure 132.
Downlink	GSM	Low	In Band	Figure 133.
Downlink	GSM	Low	30 – 2900	Figure 134.
Downlink	GSM	Low	2900 - 20000	Figure 135.
Downlink	GSM	High	In Band	Figure 136.
Downlink	GSM	High	30 – 2900	Figure 137.
Downlink	GSM	High	2900 - 20000	Figure 138.

7.6 Field Strength of Spurious Emissions - FCC Section 2.1053, 24.238

7.6.1 Measurement Procedure

The equipment under test is placed on the Open Area Test Site (described in section 2.1) on a wooden table at the turntable center. For each spurious emission, the antenna mast is raised and lowered from one (1) to four (4) meters and the turntable is rotated 360º and the maximum reading on the spectrum analyzer is recorded. This repeated for both horizontal and vertical polarizations of the receive antenna.

The equipment under test is then replaced with a substitution antenna fed by a signal generator. The signal generator's frequency is set to that of the spurious emission recorded from the equipment under test. The antenna mast is raised and lowered from one (1) to four (4) meters to obtain a maximum reading on the spectrum analyzer. The output of the signal generator is then adjusted until the reading on the spectrum analyzer matches that obtained from the equipment under test. The signal generator level is recorded.

The power in dBm of each spurious emission is calculated by correcting the signal generator level for the cable loss and gain of the substitution antenna referenced to a dipole. The spectrum was investigated in accordance to CFR 47 Part 2.1057. A CW was used for both uplink and downlink for low, middle and high channels. The worst case emissions are reported. All emissions not reported were below the noise floor of the measurement equipment.

Results of the test are shown below in Table 7.6-1 to 7.6-3.

7.6.2 Measurement Results

Table 7.6.-1: Field Strength of Spurious Emissions Low Channel

Frequency (GHz)	Uncorrected Radiated Level (dBuV)	Generator Level (dBm)	Antenna Polarity (H/V)	Correction Factor (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
Uplink							
3.7	-58.48	-63	H	6.23	-56.77	-13.00	43.77
3.7	-60.54	-67	V	6.23	-60.77	-13.00	47.77
7.4	-61.81	-49	H	6.69	-42.31	-13.00	29.31
7.4	-62.37	-47	V	6.69	-40.31	-13.00	27.31
Downlink							
3.86	-60.27	-63	H	6.15	-56.85	-13.00	43.85
3.86	-59.39	-52	V	6.15	-45.85	-13.00	32.85

Table 7.6.-2: Field Strength of Spurious Emissions Mid Channel

Frequency (GHz)	Uncorrected Radiated Level (dBuV)	Generator Level (dBm)	Antenna Polarity (H/V)	Correction Factor (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
Uplink							
3.76	-55.43	-48	H	6.20	-41.80	-13.00	28.80
3.76	-61.17	-59	V	6.20	-52.80	-13.00	39.80
5.64	62.24	-53	V	6.31	-46.69	-13.00	33.69
7.52	-61.63	-51	V	6.59	-44.41	-13.00	31.41
9.4	-60.23	-48	V	5.98	-42.02	-13.00	29.02
Downlink							
3.92	-59.23	-59	H	6.13	-52.87	-13.00	39.87
3.92	-59.26	-67	V	6.13	-60.87	-13.00	47.87

Table 7.6.-3: Field Strength of Spurious Emissions High Channel

Frequency (GHz)	Uncorrected Radiated Level (dBuV)	Generator Level (dBm)	Antenna Polarity (H/V)	Correction Factor (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
Uplink							
3.82	-53.10	-45	H	6.17	-38.83	-13.00	25.83
3.82	-55.66	-52	V	6.17	-45.83	-13.00	32.83
5.73	-61.66	-49	H	6.49	-42.51	-13.00	29.51
5.73	-59.83	-46	V	6.49	-39.51	-13.00	26.51
7.64	-59.7	-50	H	6.66	-43.34	-13.00	30.34
7.64	-58.99	-45	V	6.66	-38.34	-13.00	25.34
Downlink							
3.98	-62.28	-65	H	6.10	-58.90	-13.00	45.90
3.98	-61.62	-68	V	6.10	-61.90	-13.00	48.90

7.7 Frequency Stability - FCC Section 2.1055, 24.235

The device contains no frequency translation therefore frequency stability requirements are not applicable.

7.8 Radiated Emissions (Unintentional Radiators) - FCC Section 15.109

7.8.1 Measurement Procedure

The equipment under test is placed on the Open Area Test Site (described in section 2.1) on a wooden table at the turntable center. For each radiated emission, the antenna mast is raised and lowered from one (1) to four (4) meters and the turntable is rotated 360º to obtain a maximum peak reading on the spectrum analyzer. The radiated emissions are then measured using an EMI receiver employing a CISPR quasi-peak detector for frequencies below 1000 MHz and an Average detector function for frequencies above 1000 MHz. This repeated for both horizontal and vertical polarizations of the receive antenna.

The field strength of each radiated emission is calculated by correcting the EMI receiver level for cable loss, amplifier gain, and antenna correction factors.

Field Strength (dBuV/m) = EMI Receiver Level (dBuV) + Cable Loss (dB) – Amplifier Gain (dB) + Antenna Correction Factor (1/m)

Results of the test are shown below in Table 7.8.-1.

7.8.2 Measurement Results

Table 7.8-1: Radiated Emissions Tabulated Data

Frequency (MHz)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Position (°)	Total Correction Factor (dB)	Corrected Reading (dBµV)	Limit (dBµV)	Margin (dB)	Results
40.88	V	100	49	-11.9	31.7	40	8.3	**PASS**
43.76	V	108	49	-13.2	36.7	40	3.3	**PASS**
60.64	V	105	265	-19.7	20.6	40	19.4	**PASS**
295.92	V	332	6	-8.9	25.3	46	20.7	**PASS**
671.92	H	192	192	-0.3	21.5	46	24.5	**PASS**
849.68	V	102	0	2.2	32.6	46	13.4	**PASS**
868.72	V	295	50	1.9	31.8	46	14.2	**PASS**
906.8	V	171	268	2.5	31.9	46	14.1	**PASS**
925.76	V	400	287	3.2	24.8	46	21.2	**PASS**
945.04	V	390	0	3.7	34.7	46	11.3	**PASS**

7.9 Power Line Conducted Emissions - FCC Section 15.107

7.9.1 Measurement Procedure

Conducted emissions were performed from 150kHz to 30MHz with the spectrum analyzer's resolution bandwidth set to 9kHz and the video bandwidth set to 30kHz. The calculation for the conducted emissions is as follows:

Corrected Reading = Analyzer Reading + LISN Loss + Cable Loss
Margin = Corrected Reading – Applicable Limit

Results of the test are shown below in and Tables 7.9-1 through 7.9-4 and Figure 7.9-1 through 7.9-2

7.9.2 Measurement Results

Table 7.9-1: Line 1 Conducted EMI Results (Quasi-Peak)

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.172	44.1	9.5	64.8	20.7	L1	GND
0.358	36.2	9.5	58.7	22.5	L1	GND
0.484	45.0	9.5	56.2	11.2	L1	GND
0.604	46.1	9.5	56.0	9.8	L1	GND
0.724	39.7	9.5	56.0	16.2	L1	GND
0.838	43.3	9.6	56.0	12.6	L1	GND
0.97	45.3	9.6	56.0	10.6	L1	GND
1.198	42.9	9.5	56.0	13.0	L1	GND
1.450	42.0	9.5	56.0	13.9	L1	GND
1.678	36.6	9.5	56.0	19.3	L1	GND

Table 7.9-2: Line 1 Conducted EMI Results (Average)

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.154	18.4	9.6	55.7	37.3	L1	GND
0.358	28.9	9.5	48.7	19.8	L1	GND
0.484	38.9	9.5	46.2	7.3	L1	GND
0.604	39.5	9.5	46.0	6.4	L1	GND
0.724	33.2	9.5	46.0	12.7	L1	GND
0.838	35.2	9.6	46.0	10.7	L1	GND
0.964	37.2	9.6	46.0	8.7	L1	GND
1.204	33.5	9.5	46.0	12.4	L1	GND
1.444	31.2	9.5	46.0	14.7	L1	GND
1.678	25.8	9.5	46.0	20.1	L1	GND

Table 7.9-3: Line 2 Conducted EMI Results (Quasi-Peak)

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.244	46.1	9.5	61.9	15.8	L2	GND
0.478	46.0	9.5	56.3	10.3	L2	GND
0.598	48.1	9.5	56.0	7.8	L2	GND
0.724	39.4	9.5	56.0	16.5	L2	GND
0.838	44.3	9.6	56.0	11.6	L2	GND
0.958	45.6	9.6	56.0	10.3	L2	GND
1.198	44.6	9.5	56.0	11.3	L2	GND
1.438	43.7	9.5	56.0	12.2	L2	GND
1.678	39.1	9.5	56.0	16.8	L2	GND
2.062	37.2	9.6	56.0	18.7	L2	GND

Table 7.9-4: Line 2 Conducted EMI Results(Average)

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.238	41.2	9.5	52.1	10.8	L2	GND
0.478	41.7	9.5	46.3	4.6	L2	GND
0.604	43.5	9.5	46.0	2.4	L2	GND
0.724	36.2	9.5	46.0	9.7	L2	GND
0.844	39.8	9.6	46.0	6.1	L2	GND
0.964	41.3	9.6	46.0	4.6	L2	GND
1.204	38.4	9.5	46.0	7.5	L2	GND
1.444	36.7	9.5	46.0	9.2	L2	GND
1.678	31.4	9.5	46.0	14.5	L2	GND
2.044	27.7	9.6	46.0	18.2	L2	GND

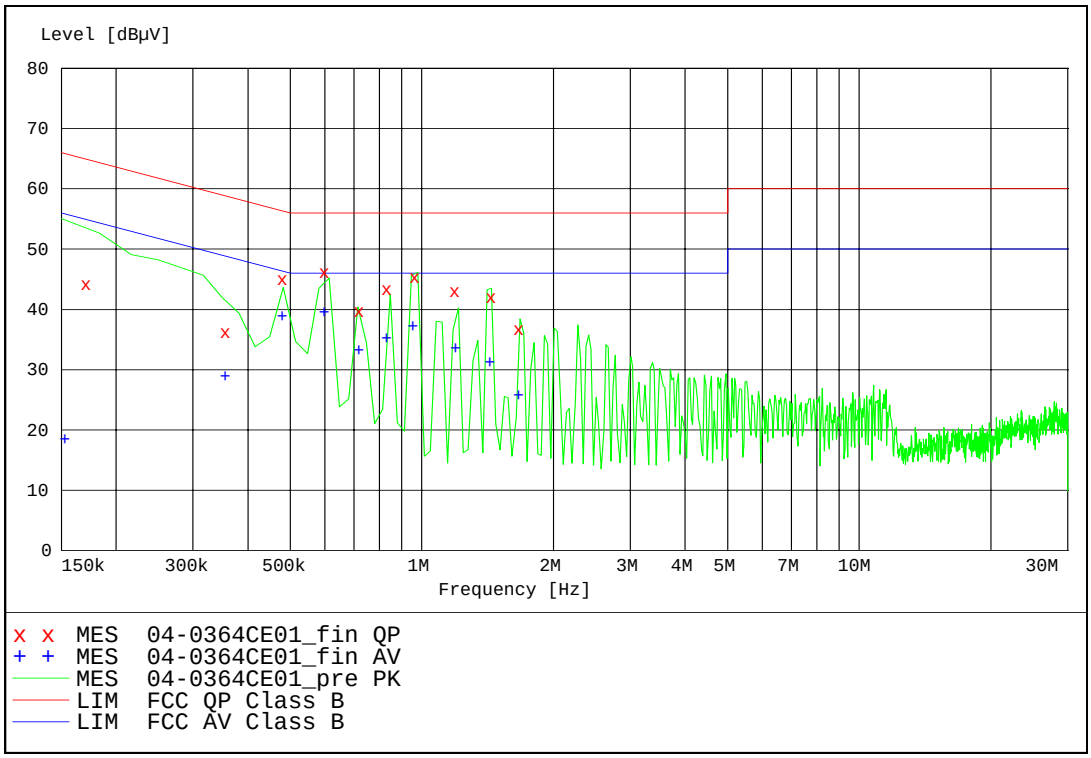

Figure 7.9-1: Conducted Emissions Graph – Line 1

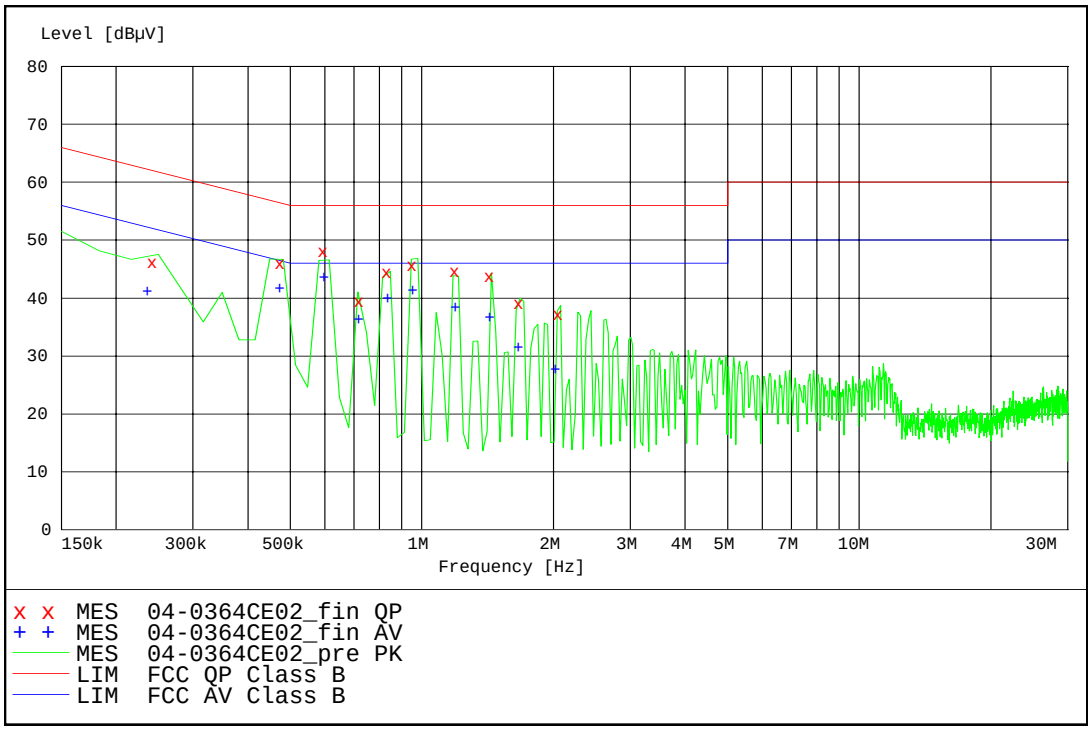

Figure 7.9-2: Conducted Emissions Graph – Line 2

8.0 CONCLUSION

In the opinion of ACS, Inc. the YX500-PCS, manufactured by Wireless Extenders, meets the requirements of FCC Part 24 subpart E.