

RADIATED AND LINE CONDUCTED EMISSIONS REPORT

I. GENERAL INFORMATION

Requirement: Federal Communications Commission
 U-NII Certification Application

Test Requirements: 15.205, 15.207, 15.209, 15.401

Applicant: eXS Inc.
 1900 Alameda de las Pulgas
 Suite 110
 San Mateo, CA 94403-1222

Product ID: FCC ID: **TTFN01A1206**
Model No. 5001A

II. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

eXS model 5001A is a dual-band dual radio 802.11 AP.

RF Specifications

RF Frequency Band 2412-2462 MHz (DTS)
 5745-5805 MHz (DTS)
 5180-5320 MHz (U-NII)

Modulation Type 802.11 b: DQPSK, CCK (DTS)
 802.11 g: OFDM (DTS)
 802.11 a OFDM (U-NII, 5.8 GHz DTS)

Transmitter Output Power 5180 - 5240 MHz: 0.0383 watts (15.8dBm)
 5260 - 5320 MHz: 0.0356 watts (15.5dBm)

TX Antenna: 2.4/5 GHz Wenizen model W4E-WO-32

III. TEST LOCATION

All emissions tests were performed at:

Compliance Certification Services
571F Monterey Road
Morgan Hill, CA 95037

FCC ID: **TTFN01A1206**

Testing performed 3-4 November 2005.

T.N. Cokenias

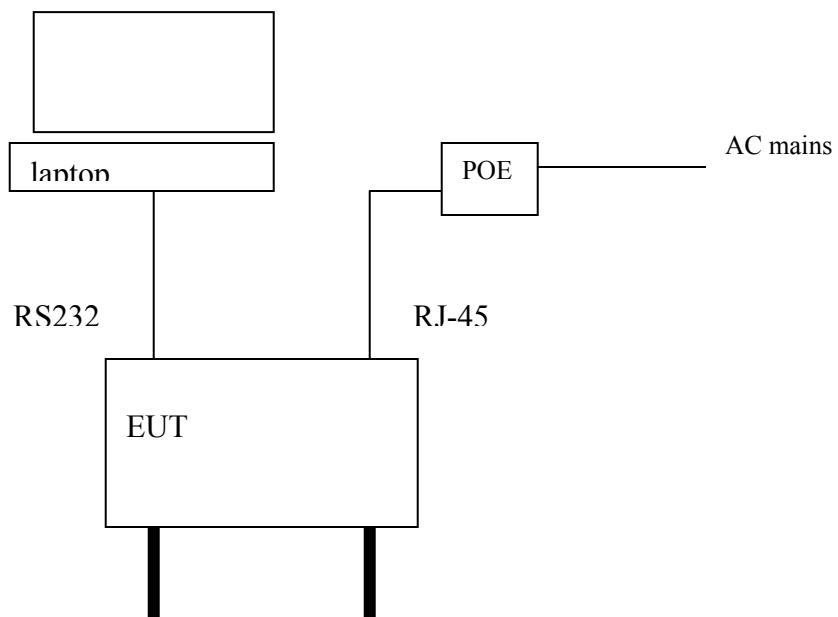
T.N. Cokenias
Agent for eXS Inc.

12 December 2005

Test Equipment List

TEST EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	3/29/06
RF Filter Section	HP	85420E	3705A00256	3/29/06
Antenna, Bilog 30MHz ~ 2Ghz	Sunol Sciences	JB1	A121003	3/3/06
Antenna, Horn, 18-26 GHz	ARA	MWH-1826/B	1049	9/12/06
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	4/22/06
Pre-amplifier	MITEQ	NSP2600-SP	92342	8/15/06
Peak Power Meter	Agilent	E4416A	GB41291160	2/9/06
Peak / Average Power Sensor	Agilent	E9327A	US40440755	2/10/06
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent	E4446A	US42070220	1/1/06
High Pass Filter 7.6 GHz	IFI	n/a	2682	3/15/06
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/06
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	10/21/06

Test Configuration



TEST PROCEDURES

Radiated emissions testing per the methods of ANSI C63.4.

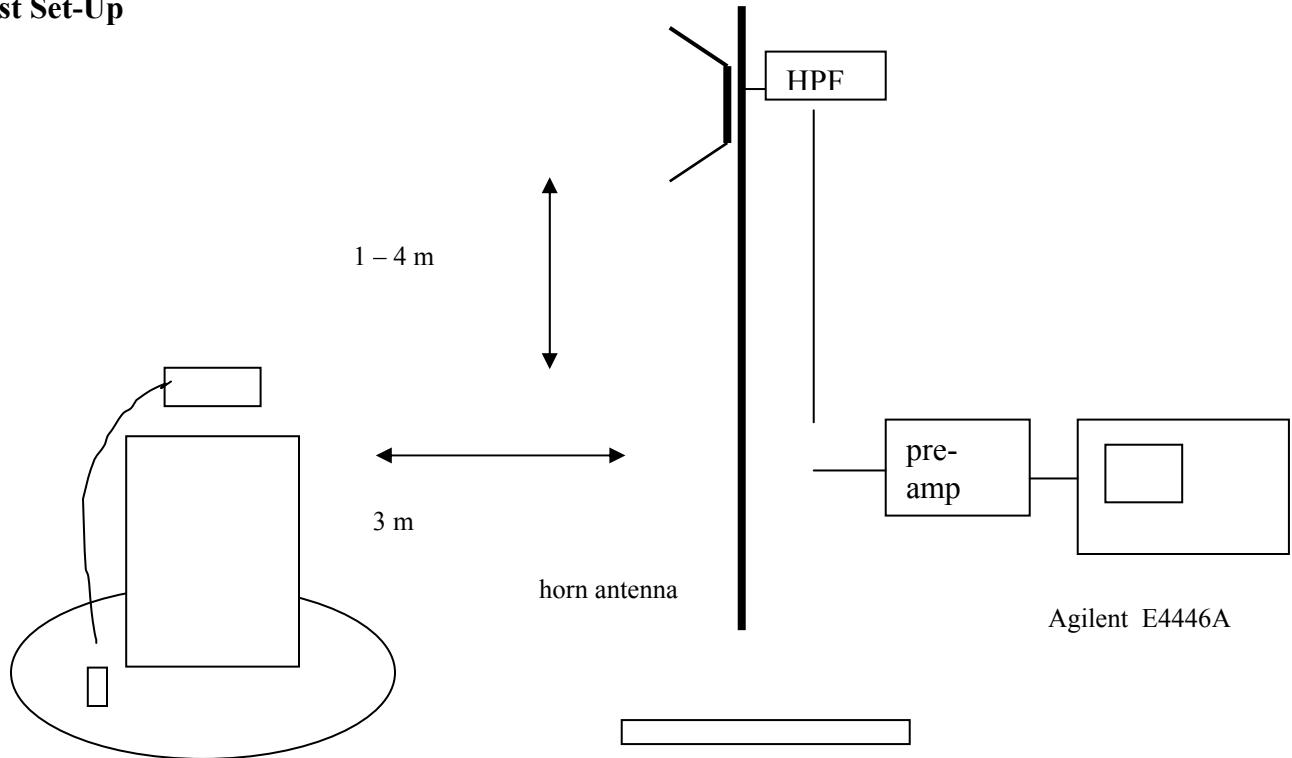
Measurement Equipment Used:

Spectrum analyzer
Hi pass filter, 7.6 GHz
Pre-amplifier, 1 – 26.5 GHz
Horn antenna, 1-18 GHz
Horn 18-26 GHz

Radiated Emissions Above 1 GHz

Test Requirement: 15.205, 15.209, 15.247

Test Set-Up



Test Procedures, 1- 26 GHz:

1. The EUT was placed on a wooden table resting on a turntable on the Site A 10m open area test site. The search antenna was placed 3m from the EUT. The EUT antenna was mounted vertically as per normal installation.
2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205. Radiated emissions were investigated for a LOW channel, MID channel, and HIGH channel in the 5180-5320 MHz band.
3. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.

Radiated emissions were performed at each frequency for the following antenna:

Antenna Type	Frequency range	Gain	Antenna Mfr.	Model
Omni monopole	5.1-5.3 GHz 2.4 GHz	6dBi 3.5 dBi	Wenizen.	W4E-WO-32

Test Results: PASS. Worst case results are presented. Refer to data below.

Radiated Emissions, 1-18 GHz

11/03/05 High Frequency Measurement Compliance Certification Services, Morgan Hill Open Field Site															
Test Engr: Ninoos Davoudi Project #: 05U3800 Company: EXS EUT Descrip.: AP dual band 2.4 & 5 GHz EUT M/N:5001A Test Target:FCC15.209 Mode Oper: Testing mode															
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												
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)
a mode L 5180															
10.360	3.0	42.4	35.0	37.9	4.0	-33.9	0.0	0.8	51.1	43.8	74.0	54.0	-22.9	-10.2	V
10.360	3.0	41.5	29.9	37.9	4.0	-33.9	0.0	0.8	50.2	38.7	74.0	54.0	-23.8	-15.3	H
15.540	3.0	42.6	29.9	39.6	5.2	-32.7	0.0	0.7	55.4	42.8	74.0	54.0	-18.6	-11.2	H
15.540	3.0	41.7	29.9	39.6	5.2	-32.7	0.0	0.7	54.5	42.8	74.0	54.0	-19.5	-11.2	V
a mode M 5260															
10.520	3.0	47.3	30.1	37.9	4.0	-33.9	0.0	0.8	56.2	39.0	74.0	54.0	-17.8	-15.0	V
10.520	3.0	50.5	30.3	37.9	4.0	-33.9	0.0	0.8	59.4	39.2	74.0	54.0	-14.6	-14.8	H
15.780	3.0	42.1	30.5	39.2	5.3	-32.7	0.0	0.7	54.6	43.0	74.0	54.0	-19.4	-11.0	H
15.780	3.0	42.0	30.5	39.2	5.3	-32.7	0.0	0.7	54.5	43.0	74.0	54.0	-19.5	-11.0	V
a mode H 5320															
10.640	3.0	43.0	35.0	38.0	4.0	-33.8	0.0	0.8	51.9	43.9	74.0	54.0	-22.1	-10.1	V
10.640	3.0	41.7	30.1	38.0	4.0	-33.8	0.0	0.8	50.7	39.0	74.0	54.0	-23.3	-15.0	H
15.960	3.0	42.1	30.5	38.9	5.3	-32.7	0.0	0.7	54.3	42.8	74.0	54.0	-19.7	-11.2	H
15.960	3.0	42.5	30.5	38.9	5.3	-32.7	0.0	0.7	54.8	42.8	74.0	54.0	-19.2	-11.2	V

Radiated Emissions above 18 GHz

11/03/05 High Frequency Measurement Compliance Certification Services, Morgan Hill Open Field Site																																																																																									
Test Engr: Ninoos Davoudi Project #: 05U3800 Company: EXS EUT Descrip.: AP dual band 2.4 & 5 GHz EUT M/N:5001A Test Target: FCC15.209 Mode Oper: Testing mode Average Power Meter: Low = 15.8 dBm, Mid = 15.8 dBm, High = 15.8 dBm																																																																																									
Test Equipment:																																																																																									
<table border="1"> <tr> <td>Horn 1-18GHz</td> <td>Pre-amplifier 1-26GHz</td> <td>Pre-amplifier 26-40GHz</td> <td colspan="11">Horn > 18GHz</td> </tr> <tr> <td>T34 HP 8449B</td> <td></td> <td></td> <td colspan="11">T125, ARA 18-26GHz; S/N:1007</td> </tr> <tr> <td colspan="15">Hi Frequency Cables</td> </tr> <tr> <td>2 foot cable</td> <td>3 foot cable</td> <td>12 foot cable</td> <td colspan="5">HPF</td> <td colspan="5">Reject Filter</td> <td colspan="3">Peak Measurements</td> </tr> <tr> <td>Ninoos 177079010</td> <td></td> <td>Ninoos 208946002</td> <td colspan="5"></td> <td colspan="5"></td> <td colspan="3">RBW=1MHz ; VBW=10Hz</td> </tr> </table>															Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz											T34 HP 8449B			T125, ARA 18-26GHz; S/N:1007											Hi Frequency Cables															2 foot cable	3 foot cable	12 foot cable	HPF					Reject Filter					Peak Measurements			Ninoos 177079010		Ninoos 208946002											RBW=1MHz ; VBW=10Hz		
Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz																																																																																						
T34 HP 8449B			T125, ARA 18-26GHz; S/N:1007																																																																																						
Hi Frequency Cables																																																																																									
2 foot cable	3 foot cable	12 foot cable	HPF					Reject Filter					Peak Measurements																																																																												
Ninoos 177079010		Ninoos 208946002											RBW=1MHz ; VBW=10Hz																																																																												
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL	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)																																																																										
a mode 1 LOW channel																																																																																									
5180MHz																																																																																									
20.720	3.0	43.2	32.2	34.1	6.4	-33.2	0.0	0.0	50.5	39.5	74	54	-23.5	-14.5	V																																																																										
20.720	3.0	42.6	31.2	34.1	6.4	-33.2	0.0	0.0	49.9	38.4	74	54	-24.1	-15.6	H																																																																										
25.900	1.0	45.4	34.0	35.9	6.8	-33.4	-9.5	0.0	45.1	33.7	74	54	-28.9	-20.3	H																																																																										
25.900	1.0	46.4	34.2	35.9	6.8	-33.4	-9.5	0.0	46.1	33.9	74	54	-27.9	-20.1	V																																																																										
amode MID channel																																																																																									
5260MHz																																																																																									
21.040	1.0	45.1	37.2	34.1	6.4	-33.2	-9.5	0.0	42.9	35.0	74	54	-31.1	-19.0	V																																																																										
21.040	1.0	43.4	31.5	34.1	6.4	-33.2	-9.5	0.0	41.2	29.3	74	54	-32.8	-24.7	H																																																																										
26.300	1.0	47.3	34.5	39.0	6.8	-33.6	-9.5	0.0	50.0	37.2	74	54	-24.0	-16.8	H																																																																										
26.300	1.0	47.7	34.7	39.0	6.8	-33.6	-9.5	0.0	50.4	37.4	74	54	-23.6	-16.6	V																																																																										
amode HIGH channel																																																																																									
5320MHz																																																																																									
21.280	1.0	43.1	31.4	34.2	6.4	-33.2	-9.5	0.0	41.0	29.3	74	54	-33.0	-24.7	V																																																																										
21.280	1.0	43.0	31.4	34.2	6.4	-33.2	-9.5	0.0	40.9	29.3	74	54	-33.1	-24.7	H																																																																										
26.600	1.0	46.4	33.9	39.0	6.6	-33.7	-9.5	0.0	48.8	36.3	74	54	-25.2	-17.7	H																																																																										
26.600	1.0	46.6	34.0	39.0	6.6	-33.7	-9.5	0.0	49.0	36.4	74	54	-25.0	-17.6	V																																																																										
no emissions detected above 26.3 GHz																																																																																									
f	Measurement Frequency	Amp	Preamp Gain	D Corr	Distance Correct to 3 meters				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																																																																																						

Radiated Emissions, Restricted Bands 4.5-5.15/5.35-5.46 GHz

No emissions were detected in the restricted bands adjacent to the U-NII operating frequencies. Noise floor was more than 6 dB below radiation limit.

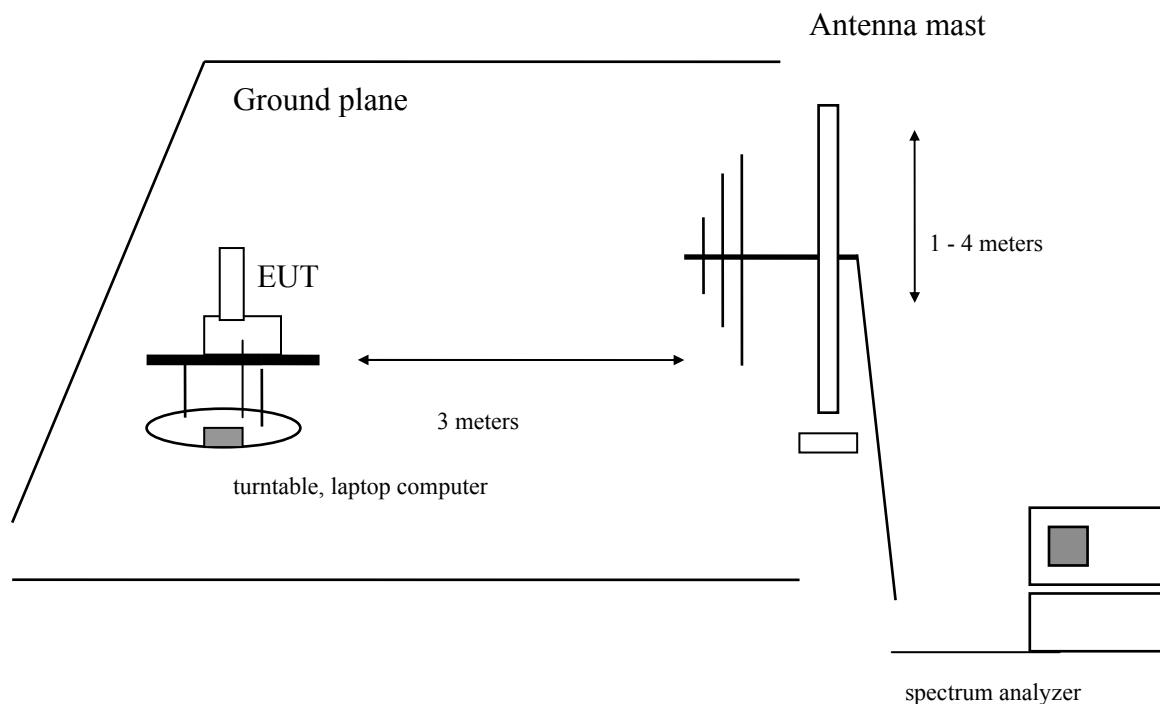
Radiated Emissions

Test Requirement: 15.109

Measurement Equipment Used:

Receiver, 9 kHz - 2.9 GHz
Biconolog Antenna

Radiated Test Set-up, 30 - 1000 MHz



Test Procedures

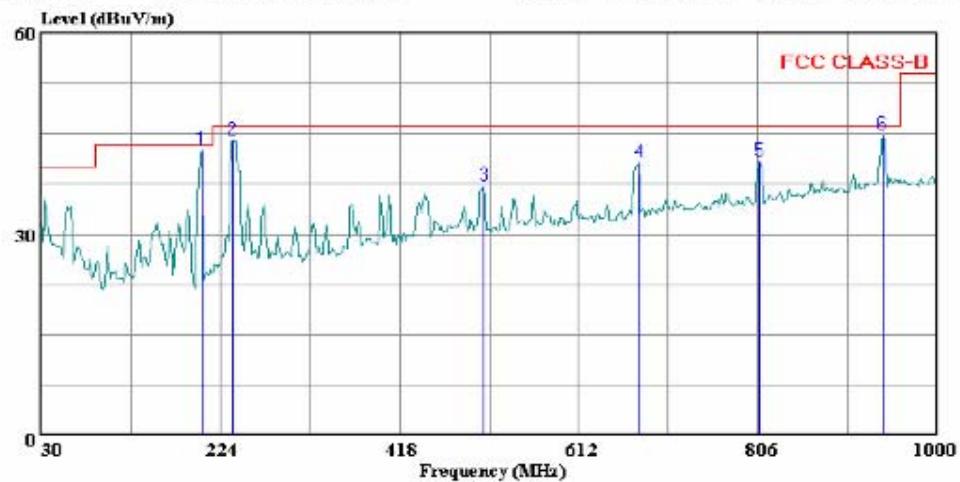
1. The EUT was placed on a wooden table resting on a turntable on the open air test site. The search antenna was placed 3m from the EUT. The EUT antenna was mounted vertically as per normal installation. The EUT was set to transmit continuously on the MID channel.
2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205.
3. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.

Test Results: EUT meets requirements. All transmitter emissions in the 30-1000 MHz band are at least 20 below the carrier:



561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 8 File#: sprious.EMI Date: 11-03-2005 Time: 14:58:53



(Audit ATC)

Trace: 7

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator: : Ninous Davoudi
Project #: : 05U3800
Company: : EXS
EUT: : AP eXS
Model No. : 5001A
Configuration : EUT connected to laptop
Target of Test : FCC Class B
Mode of Operation: Normal Power on.

Page: 1

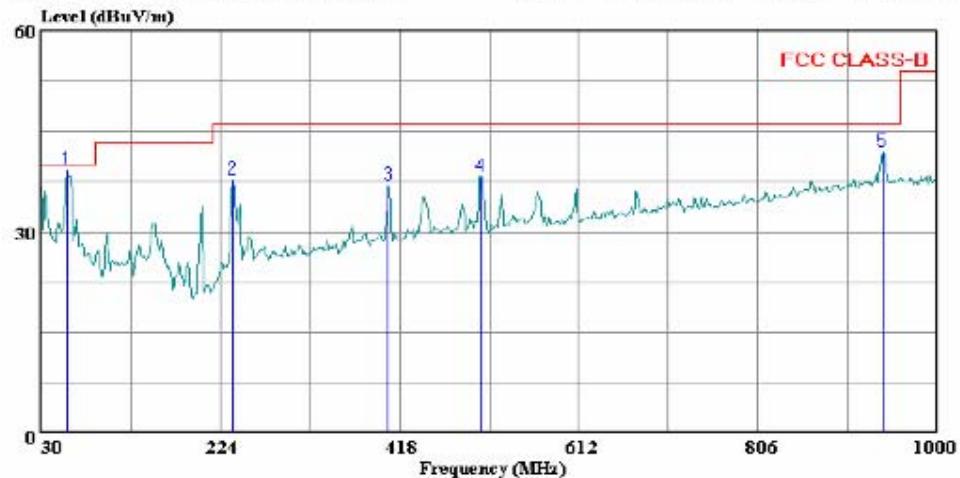
Freq	Read		Limit	Over	Remark	
	MHz	dBuV				
		dB	dBuV/m	dBuV/m	dB	
1	203.630	30.89	11.61	42.50	43.50	-1.00 Peak
2	237.580	30.15	13.78	43.93	46.00	-2.07 Peak
3	509.180	17.64	19.57	37.21	46.00	-8.79 Peak
4	676.990	18.72	21.93	40.65	46.00	-5.35 Peak
5	807.940	17.21	23.77	40.98	46.00	-5.02 Peak
6	940.830	19.54	25.29	44.83	46.00	-1.17 Peak

FCC ID: **TTFN01A1206**



561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 10 File#: sprious.EMI Date: 11-03-2005 Time: 15:04:58



(Audit ATC)

Trace: 9

Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : Ninous Davoudi
Project #: : 05U3800
Company: : EXS
EUT: : AP eXS
Model No. : 5001A
Configuration : EUT connected to laptop
Target of Test : FCC Class B
Mode of Operation: Normal Power on.

Page: 1

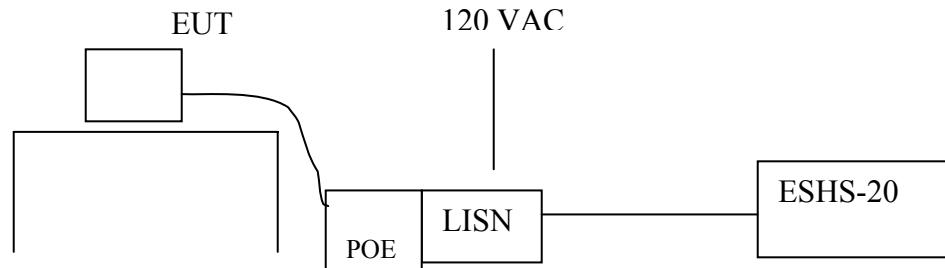
Freq	Read		Limit	Over	Remark	
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	58.130	27.11	12.18	39.29	40.00	-0.71 Peak
2	237.580	23.91	13.78	37.69	46.00	-8.31 Peak
3	405.390	19.38	17.49	36.87	46.00	-9.13 Peak
4	505.300	18.77	19.48	38.25	46.00	-7.75 Peak
5	940.830	16.75	25.29	42.04	46.00	-3.96 Peak

AC Line Conducted Emissions
Test Requirement: 15.107, 15.207

Measurement Equipment Used:

Rhode & Schwarz EMI Receiver ESHS-20
Fischer Custom Communication LISN, FCC-LISN-50/250-25-2

AC Conducted Set-up



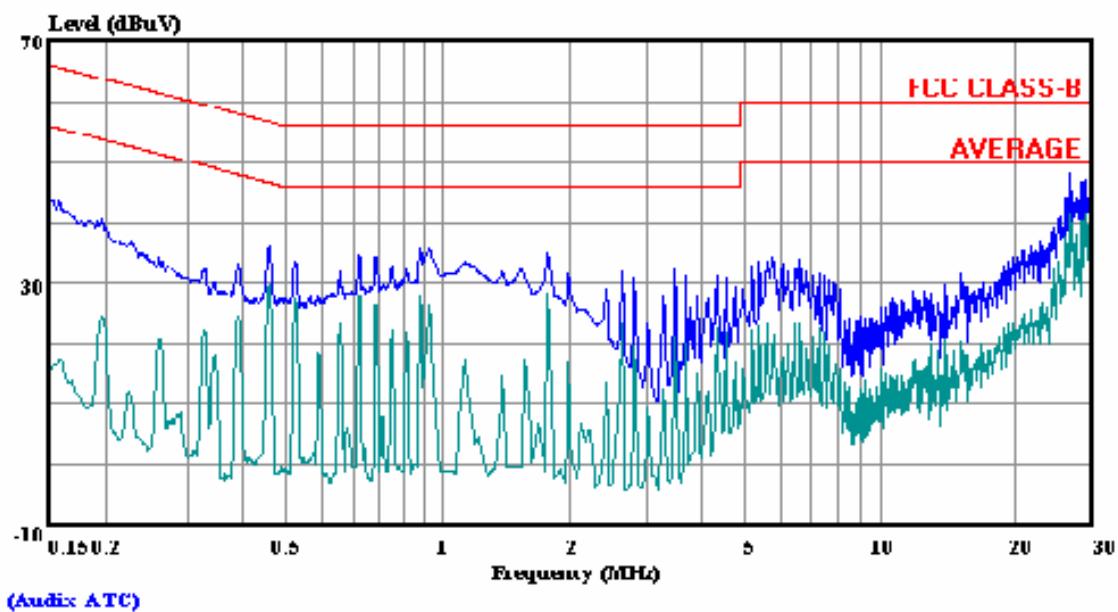
Test Procedure

1. The EUT was placed on a wooden table 40 cm from a vertical ground plane and approximately 80 cm above the horizontal ground plane on the floor. The EUT was set to transmit in normally.
2. Line conducted data was recorded for both NEUTRAL and HOT lines.

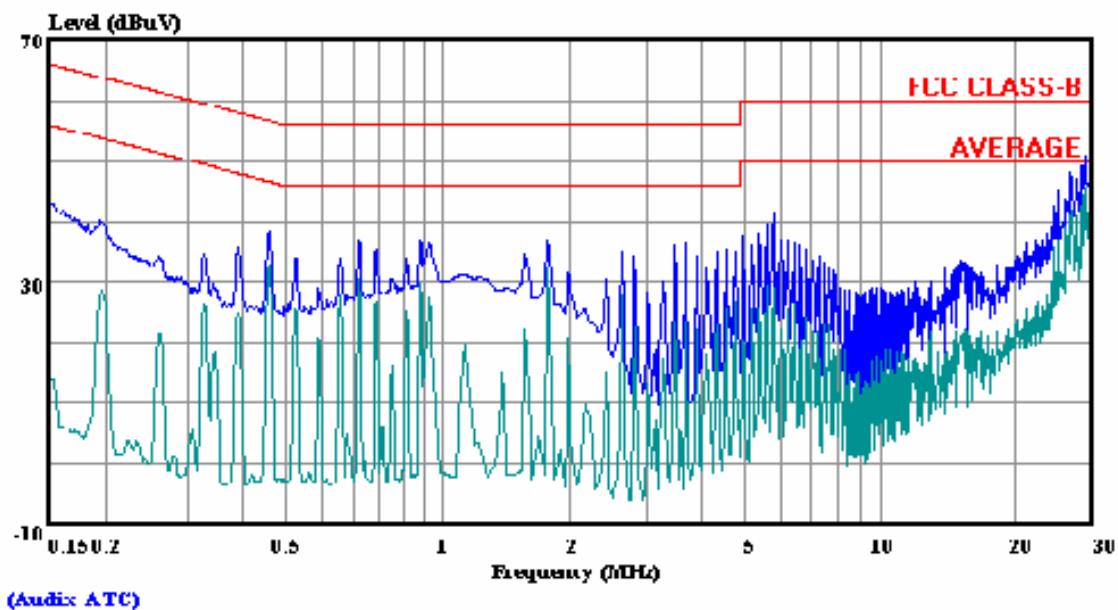
Test Results

PASS. Refer to attached plots and tabulated data.

Line 1



Line 2



Blue trace: PEAK detector

Green trace: AVERAGE detector