



## Test Report

Product Name : IP Sharing + Ethernet for Cable/xDSL Modem

Model No.: CAS2042

FCC ID.: MQ4CAS2042

Applicant : AboCom Systems, Inc.

Address : 1F, No. 21, R&D Road II, Science-Based Industrial Park,  
Hsin-Chu, Taiwan, R.O.C.

Date of Receipt : Dec. 18, 2001

Date of Test : Dec. 21, 2001

Report No. : 01CH060FI

The test results relate only to the samples tested.

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This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

## Test Report Certification

Test Date : Dec. 21, 2001

Report No. : 01CH060FI



**Accredited by NIST (NVLAP)**  
NVLAP Lab Code: 200347-0

Product Name	:	IP Sharing + Ethernet for Cable/xDSL Modem
Applicant	:	AboCom Systems, Inc.
Address	:	1F, No. 21, R&D Road II, Science-Based Industrial Park, Hsin-Chu, Taiwan, R.O.C.
Manufacturer	:	AboCom Systems, Inc.
Model No.	:	CAS2042
FCC ID.	:	MQ4CAS2042
Rated Voltage	:	AC 120V/60Hz
Trade Name	:	AboCom
Measurement Standard	:	CISPR 22:1997
Measurement Procedure	:	ANSI C63.4:1992
Classification	:	Class B
Test Result	:	Complied

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## TABLE OF CONTENTS

Description	Page
<b>1. GENERAL INFORMATION .....</b>	<b>4</b>
1.1. EUT Description .....	4
1.2. Operation Description.....	4
1.3. Tested System Details .....	5
1.4. Configuration of Tested System.....	6
1.5. EUT Exercise Software.....	6
1.6. Test Facility.....	7
<b>2. Conducted Emission .....</b>	<b>8</b>
2.1. Test Equipment List .....	8
2.2. Test Setup.....	8
2.3. Limits 9	
2.4. Test Procedure.....	9
2.5. Test Result.....	9
<b>3. Radiated Emission .....</b>	<b>10</b>
3.1. Test Equipment .....	10
3.2. Test Setup.....	10
3.3. Limits 11	
3.4. Test Procedure.....	11
3.5. Test Result.....	11
<b>4. EMI Reduction Method During Compliance Testing.....</b>	<b>12</b>
<b>5. Summary of Test Datas .....</b>	<b>13</b>
5.1. Test Data of Conducted Emission.....	14
5.2. Test Data of Radiated Emission .....	15
Attachment 1: EUT Test Photographs	
Attachment 2: EUT Detailed Photographs	
Reference : Laboratory of License	

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## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name : IP Sharing + Ethernet for Cable/xDSL Modem  
Trade Name : AboCom  
FCC ID. : MQ4CAS2042  
Model No. : CAS2042  
Power Adapter : DVE, DSA-0151A-05  
Cable Out: Non-shielded, 1.8m  
LAN Cable : Non-shielded, 1.0m

Note:

1. The EUT is a IP Sharing + Ethernet for Cable/xDSL Modem.
2. QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:  
Test Mode: Mode 1: Data Transmit

### 1.2. Operation Description

The IP Sharing + Ethernet for Cable/xDSL Modem is a four-port EtherSwitch design, which can complete the DHCP and sever and all computer on local network automatically. The EUT provides 10/100 Base-T N-way Ethernet port to external Cable/xDSL Modem.

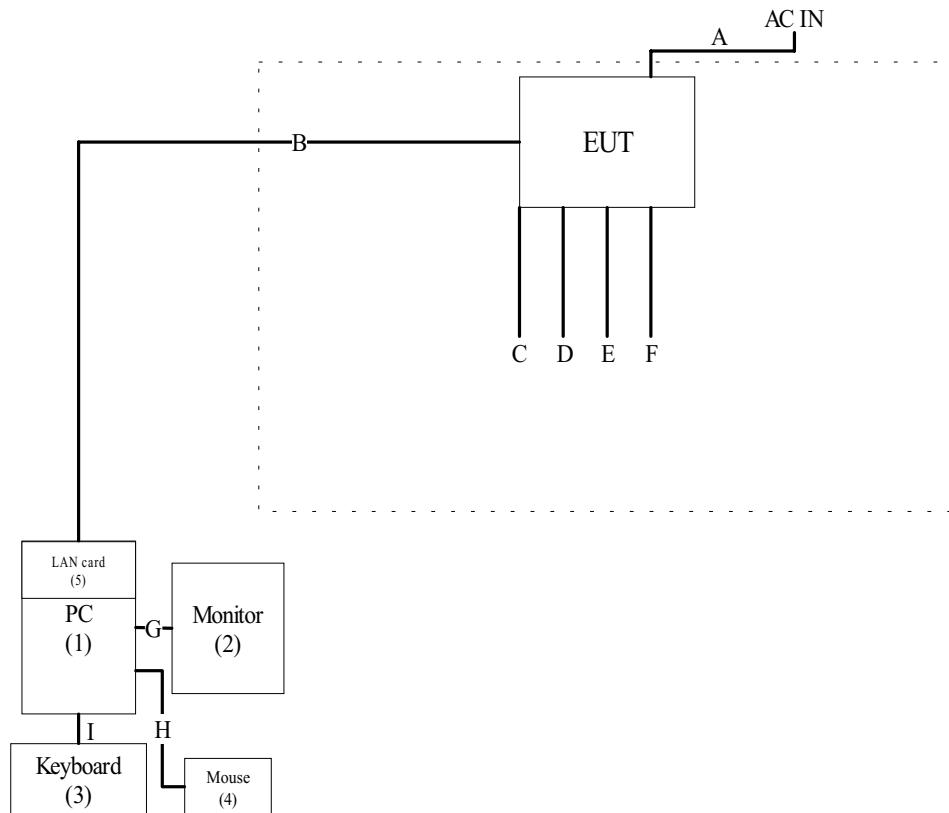
### 1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
(1)	PC	ASUS	P2L97	92M4Y03978	Non-shielded,1.8m
(2)	Monitor	SYNCO	15CTO	1910882	Shielded,1.8m
(3)	Keyboard	LEMEL	5201	753622030930	--
(4)	Mouse	Logitech	M-M34	LZA824741192	--
(5)	LAN Card	D-Link	D-530	--	--

Signal Cable Type		Signal Cable Description
A.	EUT Power Cable	Non-shielded, 1.8m
B.	LAN Cable	Non-shielded, 5.0m
C.	LAN Cable	Non-shielded, 2.0m
D.	LAN Cable	Non-shielded, 2.0m
E.	LAN Cable	Non-shielded, 2.0m
F.	LAN Cable	Non-shielded, 2.0m
G.	VGA Cable	Shielded, 1.6m
H.	Mouse Cable	Shielded, 1.8m
I.	Keyboard Cable	Shielded, 1.8m

## 1.4. Configuration of Tested System



## 1.5. EUT Exercise Software

- 1.4.1 Setup the EUT and simulators as shown on 1.3
- 1.4.2 Turn on the power of all equipment.
- 1.4.3 Boot the PC from Hard Disk.
- 1.4.4 Data will communicate through personal computer to EUT.
- 1.4.5 The personal computer monitors' will show the transmitting and receiving characteristics when the communication is success.
- 1.4.6 Repeat the above procedure 1.4.4 to 1.4.5

## 1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description: November 3, 1998 File on  
Federal Communications Commission  
FCC Engineering Laboratory  
7435 Oakland Mills Road  
Columbia, MD 21046  
Reference 31040/SIT1300F2  
September 30, 1998 Accreditation on NVLAP  
NVLAP Lab Code: 200347-0



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## 2. Conducted Emission

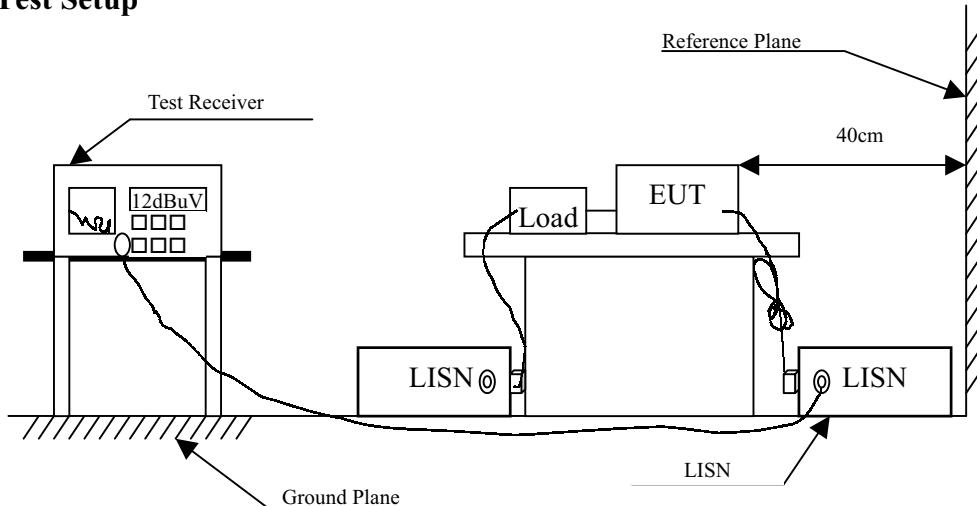
### 2.1. Test Equipment List

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 2001	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2001	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2001	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	N/A	
5	No.2 Shielded Room			N/A	

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

### 2.2. Test Setup



### 2.3. Limits

CISPR 22 Limits (dBuV)				
Frequency MHz	Class A		Class B	
	QP	AV	QP	AV
0.15 - 0.50	79	66	66-56	56-46
0.50-5.0	73	60	56	46
5.0 - 30	73	60	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

### 2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 1992 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

### 2.5. Test Result

The emission from the EUT was below the specified limits. The worst-case emissions are shown in section 5. The acceptance criterion was met and the EUT passed the test.

### 3. Radiated Emission

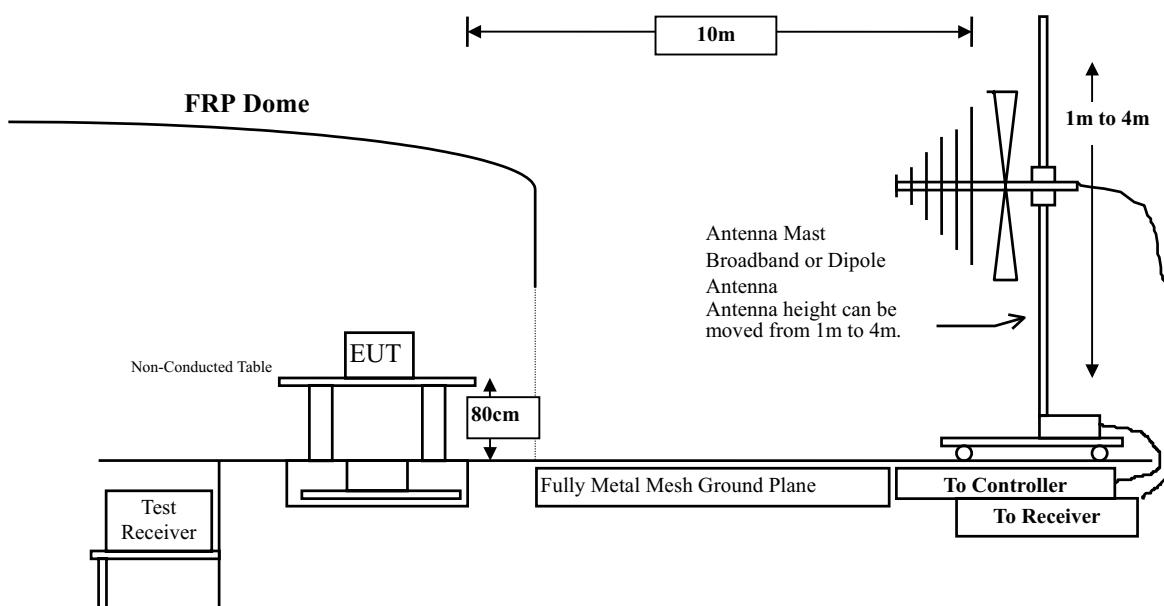
#### 3.1. Test Equipment

The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 1	X Test Receiver	R & S	ESCS 30 / 825442/14	May, 2001
	X Spectrum Analyzer	Advantest	R3261C / 71720140	May, 2001
	X Pre-Amplifier	HP	8447D/3307A01812	May, 2001
	X Bilog Antenna	Chase	CBL6112B / 12452	Sep., 2001
	Horn Antenna	EM	EM6917 / 103325	May, 2001
Site # 2	Test Receiver	R & S	ESCS 30 / 825442/17	May, 2001
	Spectrum Analyzer	Advantest	R3261C / 71720609	May, 2001
	Pre-Amplifier	HP	8447D/3307A01814	May, 2001
	Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2001
	Horn Antenna	EM	EM6917 / 103325	May, 2001

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.  
2. Mark "X" test instruments are used to measure the final test results.

#### 3.2. Test Setup



### 3.3. Limits

CISPR 22 Limits				
Frequency MHz	Class A		Class B	
	Distance (m)	dBuV/m	Distance (m)	dBuV/m
30 – 230	10	40	10	30
230 – 1000	10	47	10	37

Remark:

1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
3. RF Voltage (dBuV/m) =  $20 \log \text{RF Voltage (uV/m)}$

### 3.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 10 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:1992 on radiated measurement.

Radiated emissions were invested over the frequency range from 30MHz to 1GHz using a receiver bandwidth of 120kHz. Radiated was performed at an antenna to EUT distance of 10 meters.

### 3.5. Test Result

The emission from the EUT was below the specified limits. The worst-case emissions are shown in section 5. The acceptance criterion was met and the EUT passed the test.

**4. EMI Reduction Method During Compliance Testing**

No modification was made during testing.

## 5. Summary of Test Data

The test results in the emission were performed according to the requirements of measurement standard and process. Quietek Corporation is assumed full responsibility for the accuracy and completeness of these measurements. The test data of the emission is listed as below.

All the tests were carried out with the EUT in normal operation, which was defined as:

Test Mode: Mode 1: Data Transmit

**5.1. Test Data of Conducted Emission**

Product : IP Sharing + Ethernet for Cable/xDSL Modem  
 Test Item : Conducted Emission Test  
 Test Mode : Mode 1: Data Transmit

Frequency MHz	Cable Loss dB	LISN Factor dB	Reading Level dBuV	Emission Level dBuV	Limits dBuV
<b>Line 1</b>					
<b>Quasi-Peak</b>					
*0.150	0.00	0.00	56.05	56.05	66.00
0.224	0.02	0.00	47.66	47.68	62.66
0.372	0.05	0.00	44.33	44.38	58.45
0.673	0.08	0.00	43.00	43.08	56.00
0.973	0.10	0.00	42.53	42.63	56.00
2.296	0.15	0.00	41.48	41.63	56.00
<b>Average</b>					
0.150	0.00	0.10	49.20	49.30	56.00
0.224	0.02	0.14	41.10	41.26	52.67
0.372	0.05	0.19	40.30	40.53	48.46
0.673	0.08	0.24	34.60	34.92	46.00
0.973	0.10	0.28	31.20	31.57	46.00
2.296	0.15	0.36	24.30	24.81	46.00
<b>Line 2</b>					
<b>Quasi-Peak</b>					
*0.150	0.00	0.10	55.34	55.44	66.00
0.224	0.02	0.14	48.66	48.82	62.66
0.374	0.05	0.19	42.10	42.33	58.41
0.674	0.08	0.24	41.94	42.26	56.00
0.968	0.10	0.28	41.15	41.52	56.00
2.392	0.15	0.36	40.00	40.51	56.00
<b>Average</b>					
0.150	0.00	0.10	48.50	48.60	56.00
0.224	0.02	0.14	40.60	40.76	52.67
0.374	0.05	0.19	38.10	38.33	48.41
0.674	0.08	0.24	33.40	33.72	46.00
0.968	0.10	0.28	29.70	30.07	46.00
2.392	0.15	0.36	22.60	23.11	46.00

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “\*”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss

## 5.2. Test Data of Radiated Emission

Product : IP Sharing + Ethernet for Cable/xDSL Modem  
 Test Item : Radiated Emission  
 Test Site : No.1 OATS  
 Test Mode : Mode 1: Data Transmit

Freq. MHz	Cable Loss dB	Probe Factor dB/m	PreAMP Reading Level dB	Reading Level dBuV	Emission Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>							
175.000	2.55	9.76	0.00	2.36	14.67	15.33	30.00
200.000	2.78	9.30	0.00	5.50	17.58	12.42	30.00
250.000	3.27	12.61	0.00	4.19	20.07	16.93	37.00
375.000	4.14	15.00	0.00	8.88	28.02	8.98	37.00
500.000	4.79	17.34	0.00	6.15	28.28	8.72	37.00
625.000	5.44	19.30	0.00	4.54	29.29	7.71	37.00
675.250	5.71	19.11	0.00	1.62	26.43	10.57	37.00
*750.000	6.10	19.99	0.00	7.44	33.53	3.47	37.00
999.990	7.40	21.29	0.00	0.00	28.69	8.31	37.00
<b>Vertical</b>							
49.845	1.34	7.80	0.00	16.62	25.76	4.24	30.00
70.540	1.54	5.48	0.00	9.54	16.57	13.43	30.00
*125.000	2.07	11.49	0.00	14.69	28.25	1.75	30.00
200.000	2.78	9.07	0.00	11.28	23.14	6.86	30.00
250.000	3.27	12.26	0.00	10.01	25.54	11.46	37.00
375.000	4.14	15.40	0.00	9.32	28.86	8.14	37.00
500.000	4.79	17.14	0.00	3.45	25.38	11.62	37.00
750.000	6.10	19.04	0.00	0.95	26.09	10.91	37.00

Note:

1. All Reading Levels below 1GHz are Quasi-Peak, above are average value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss

## Attachment 1: EUT Test Photographs

**Attachment 1: EUT Test Setup Photographs**

Front View of Conducted Test



Back View of Conducted Test



Front View of Radiated Test



Back View of Radiated Test

