FCC CLASS B COMPLIANCE REPORT

for

Electromagnetic Emissions

of

PCMCIA DATA/FAX 56k MODEM CARD

Trade Name	: BTC
Model Number	: PCM56R
Serial Number	: Pre-production
FCC ID	: E5XPCM56R

Report Number : 980042-F
Date : April 11, 1998

Prepared for :

BEHAVIOR TECH COMPUTER CORP.
1F, No. 11, Lane 768, Sec. 4, Ba Te Rd.,
Taipei, Taiwan

Prepared by :

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VERIFICATION OF COMPLIANCE

Equipment Under Test:	PCMCIA DATA/FAX 56k MODEM CARD
Trade Name:	BTC
Model Number:	PCM56R
Serial Number:	Pre-production
FCC ID:	E5XPCM56R
Applicant:	BEHAVIOR TECH COMPUTER CORP. 1F, No. 11, Lane 768, Sec. 4, Ba Te Rd., Taipei, Taiwan, R.O.C.
Type of Test:	FCC Class B
Measurement Procedure:	ANSI C63.4: 1992
File Number:	980042-F
Date of test:	Apr. 7, 1998
Tested by:	Kevin Wo
Deviation:	None
Condition of Test Sample:	Normal

The above equipment was tested by C&C Laboratory, Taiwan for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, Subpart B and the measurement procedure according to ANSI C63.4, 1992. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Charles Wang / Director

GENERAL INFORMATION

Applicant:	BEHAVIOR TECH COMPUTER CORP. 1F, No.11, Lane 768, Sec. 4, Ba Te Rd., Taipei, Taiwan, R.O.C.
Contact Person:	Winston Chen
Phone Number:	(02)26516788
Fax Number:	(02)26512984
Manufacturer:	Behavior Tech Computer Corp. 1F, No. 11, Lane 768, Sec. 4, Ba Te Rd., Taipei , Taiwan, R.O.C.
File Number:	980042-F
Date of Test:	Apr. 7, 1998
Equipment Under Test:	PCMCIA DATA/FAX 56k MODEM CARD
Model Number:	PCM56R
Serial Number:	Pre-production
FCC ID:	E5XPCM56R
Type of Test:	FCC Class B
Measurement Procedure:	ANSI C63.4: 1992
Frequency Range:	150kHz to 30MHz for Line Conducted Test 30MHz to 1000MHz for Radiated Emission Test

SYSTEM DESCRIPTION

EUT Test Program:

1. Turn on all of under test equipment.
2. An EMI test software was loaded and executed under Windows environment.
3. A communication software was loaded and executed to communicated between EUT and remote side.
4. Notebook PC sends and receives message from remote side through EUT.
5. Notebook PC sends scroll 'H' message to LCD Monitor.
6. Notebook PC sends 'H' message to Printer and then print out on paper.
7. Notebook PC sends 'H' message to Modem.
8. Repeat steps 4 to 7.

PRODUCT INFORMATION

Housing Type:	Metal
EUT Power Rating:	Through the PCMCIA Slot
AC Power during Test:	115VAC/60Hz (To Notebook PC)
AC Power Cord Type:	Unshielded, 1.8m
OSC/Clock Frequencies :	28.224MHz

I/O PORT TYPES	Q'TY	TESTED WITH
1).PCMCIA CABLE	1	1

SUPPORT EQUIPMENT

Equipment	Model #	Serial #	FCC ID	Trade Name	Data Cable	Power Cord
Modem	103/212A	A038518	EF56A5103/212A	TEAM Technology	Shielded, 1.8m	Unshielded, 1.8m
Printer	DeskJet 400	MY8251C5FK	B94C2642X	HP	Shielded, 1.8m	N/A
Notebook PC	660	N/A	FCC DoC	CLEVO	N/A	Unshielded, 2.8m,w/core
Keyboard	6511-T	K6562070062P	JVP6511-T	Acer Peripherals	Shielded, 1.2m	N/A
Modem (Remote)	BTC K56E	N/A	15XK56E	Behavior Tech Computer Corp.	Shielded, 1.0m	Unshielded, 1.8m
Host PC (Remote)	D38073	SE65200103	B94VECTRA500T	HP	N/A	Unshielded, 1.8m
Mouse (Remote)	33G5430	23-398992	DZL33G5430	IBM	Shielded, 2.74m	N/A
Keyboard (Remote)	6511-T	K6568070069P	JVP6511-T	Acer Peripherals	Shielded, 1.2m	N/A
Monitor (Remote)	GDM-17SE2T	7145529	N/A	SONY	Shielded, 1.8m	Shielded, 1.8m

All the above equipment/cables were placed in worse case positions to maximize emission signals.

Grounding: Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.

MEASUREMENT PROCEDURE
(PRELIMINARY LINE CONDUCTED EMISSION TEST)

1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4: 1992 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.

2) Support equipment, if needed, was placed as per ANSI C63.4: 1992.

3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4: 1992.

4) The EUT received AC power through a Line Impedance Stabilization Network (LISN) which supplied power source of 115VAC/60Hz and was grounded to the ground plane.

5) All support equipment received power from a second LISN supplying power of 115VAC/60Hz.

6) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum analyzer connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to analyzer and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the analyzer.

7) Analyzer scanned from 150kHz to 30MHz for emissions in each of the test modes. Analyzer settings were stated on the Measuring Instrument Settings page.

8) During the above scans, the emissions were maximized by cable manipulation.

9) The following test mode(s) were scanned during the preliminary test:

Mode(s):

1. **56k Modem mode (highest speed mode)**

10) After the preliminary scan, we found the following test mode(s) producing the highest emission level.

Mode(s): 1

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

MEASUREMENT PROCEDURE
(FINAL LINE CONDUCTED EMISSION TEST)

1) EUT and support equipment was set up on the test bench as per step 10 of the preliminary test.

2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in peak mode, then the emission signal was re-checked using a Quasi-Peak and Average detector.

3) The test data of the worst case condition(s) was reported on the Summary Data page.

Data Sample:

Freq. MHz	Raw dBuV	Site CF dB	Corr'd dBuV	Q.P. Limit dBuV	Average Limit dBuV	Q.P. Margin dB	Average Margin dB	Note
x.xx	43.95	---	---	56	46	-12.05	-2.05	L1

Freq. = Emission frequency in MHz
Raw dBuV = Uncorrected Analyzer/Receiver Reading
Limit dBuV = Limit stated in standard
Margin dB = Reading in reference to limit
Note = Current carrying line of reading
"---" = The emission level complied with the Average limits, with at least 2dB margin limits, so no further recheck.

LINE CONDUCTED EMISSION LIMIT

Frequency	Maximum RF Line Voltage	
	Q.P.	AVERAGE
150kHz-500kHz	66-56dBuV	56-46dBuV
500kHz-5MHz	56dBuV	46dBuV
5MHz-30MHz	60dBuV	50dBuV

MEASUREMENT PROCEDURE
(PRELIMINARY RADIATED EMISSION TEST)

1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per ANSI C63.4: 1992 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.

2) Support equipment, if needed, was placed as per ANSI C63.4: 1992.

3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4: 1992.

4) The EUT received 115VAC/60Hz power source from the outlet socket under the turntable. All support equipment received 115VAC/60Hz power from another socket under the turntable.

5) The antenna was placed at some given distance away from the EUT as stated in ANSI C63.4: 1992. The antenna connected to the analyzer via a cable and at times a pre-amplifier would be used.

6) The analyzer quickly scanned from 30MHz to 1000MHz. Analyzer settings were stated on the Measuring Instrument Settings page. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

7) The following test mode(s) were scanned during the preliminary test:

Mode(s):

1. **56k Modem mode (highest speed mode)**

8) After the preliminary scan, we found the following test mode(s) producing the highest emission level.

Mode(s): 1

Then, the EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for reference of final testing.

MEASUREMENT PROCEDURE
(FINAL RAIDATED EMISSION TEST)

1) EUT and support equipment were set up on the turntable as per step 8 of the preliminary test.

2) The analyzer scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

3) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the limit in peak mode, then the emission signal was re-checked using a Quasi-Peak detector, and only Q.P. reading will record in this report.

4) The test data of the worst case condition(s) was reported on the Summary Data page.

Data Sample:

Freq. MHz	Raw dBuV	Site CF dB	Corr'd dBuV/m	Limit dBuV/m	Margin dB	Table Pos. (deg)	Antenna Height (m)	Note	Detector
xx.xx	14.0	7.2	21.2	30	-8.8	17.0	110	Vert	Peak

Freq.	= Emission frequency in MHz
Raw dBuV	= Uncorrected Analyzer/Receiver Reading
Site CF	= Correction factors of antenna factor and cable loss
Corr'd dBuV/m	= Raw reading converted to dBuV and CF added
Limit dBuV/m	= Limit stated in standard
Margin dB	= Reading in reference to limit
Table Position	= EUT placement in reference to antenna
Antenna Height	= Antenna height above ground plane
Note	= Antenna polarization
Detector	= Detector function (Peak, Q.P.)

RADIATED EMISSION LIMIT

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m/Q.P.)
30-230	10	30
230-1000	10	37

**Note: "/" means the limit line isn't applicable.

SUMMARY DATA
(LINE CONDUCTED TEST)

Model Number: PCM56R **Location:** Site #3

Test Mode: 56k Modem mode (highest speed mode)

Tested by: Kevin Wo

Test Results: Passed

Temperature: 24℃ **Humidity:** 82%RH

(The chart below shows the highest readings taken from the final data)

FREQ MHz	Peak RAW dBuV	Q.P. RAW dBuV	AVG RAW dBuV	Q.P. Limit dBuV	AVG Limit dBuV	Q.P. Margin dB	AVG Margin dB	NOTE
0.180	49.7	---	---	64.0	54.0	-14.3	-4.3	L1
0.295	40.4	---	---	60.3	50.3	-19.9	-9.9	L1
0.415	38.5	---	---	57.5	47.5	-19.0	-9.0	L1
2.905	37.5	---	---	56.0	46.0	-18.5	-8.5	L1
3.975	43.8	---	---	56.0	46.0	-12.2	-2.2	L1
17.135	50.6	37.9	32.3	60.0	50.0	-22.1	-17.7	L1
0.175	48.0	---	---	64.0	54.0	-16.0	-6.0	L2
0.295	37.5	---	---	60.3	50.3	-22.8	-12.8	L2
0.410	34.1	---	---	57.4	47.4	-23.3	-13.3	L2
2.060	35.4	---	---	56.0	46.0	-20.6	-10.6	L2
4.005	43.8	---	---	56.0	46.0	-12.2	-2.2	L2
17.135	50.4	37.2	31.6	60.0	50.0	-22.8	-18.4	L2

L1 = Line One (Hot side) / L2 = Line Two (Neutral side)

****NOTE: "---" denotes the emission level complied with the Average limit, with at least 2dB margin so no further re-check.**

C&C Lab. Conduction Test Site 3
EN55022 Class B

EUT: PCM56R
Manuf: BTC
Op Cond: FULL SYSTEM
Operator: Kevin Wo kevin Wo.
Test Spec: LISN=N
Comment: DOS 110Vac
File name: EN55022B.RES
Date: 07. Apr 98 21:16

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	5k	9k	PK	20ms	10dBLN	OFF

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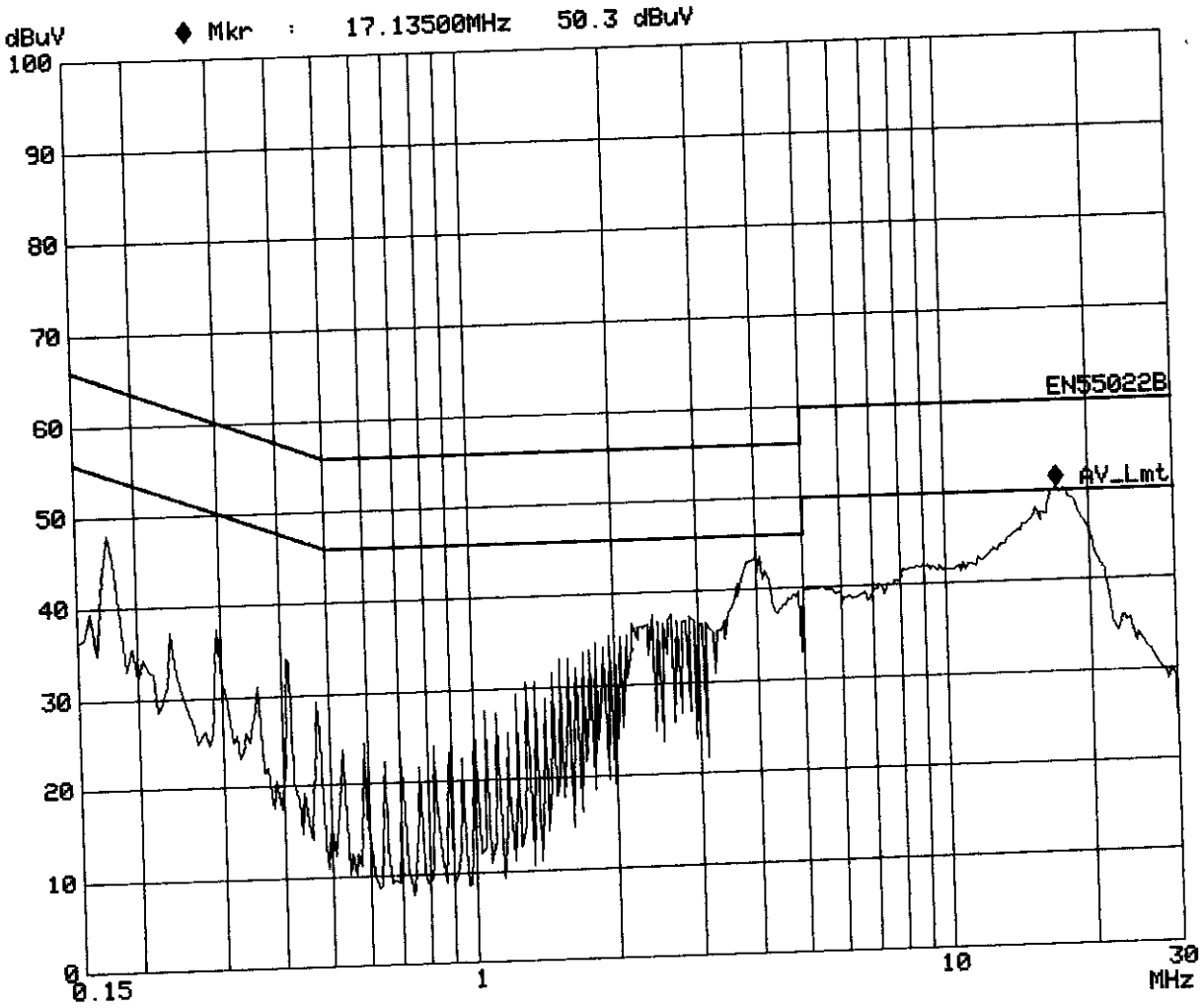

C&C Lab. Conduction Test Site 3
EN55022 Class B

EUT: PCM56R
Manuf: BTC
Op Cond: FULL SYSTEM
Operator: Kevin Wo Kevin Wo
Test Spec: LISN=L1
Comment: DOS 110Vac
File name: EN55022B.RES
Date: 07. Apr 98 20:46

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	5k	9k	PK	20ms	10dBLN	OFF

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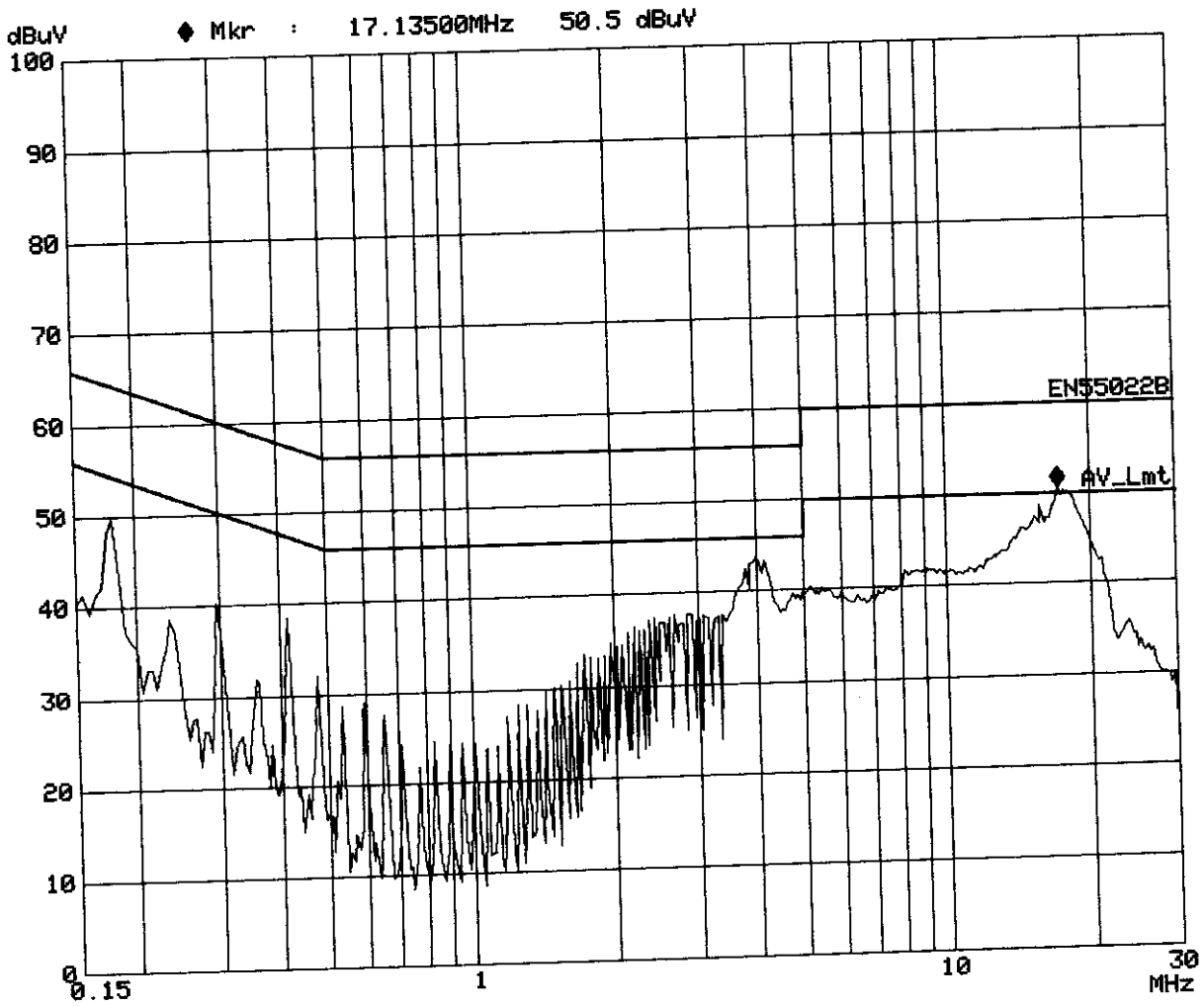

SUMMARY DATA
(RADIATED EMISSION TEST)

Model Number: PCM56R **Location:** Site #3

Test Mode: 56k Modem mode (highest speed mode)

Tested by: Kevin Wo

Test Results: Passed

Temperature: 21℃ **Humidity:** 65%RH

(The chart below shows the highest readings taken from the final data)

FREQ MHz	RAW dBuV/m	SITE CF	CORRTD dBuV/m	Q.P. LIMT (dBuV/m)	Q.P. MARGIN dB	ANT HEG (cm)	TBL POS (deg)	Detector	NOTE
127.240	9.3	15.4	24.7	30.0	-5.3	100.1	59.6	PEAK	Vert
141.440	9.6	15.1	24.7	30.0	-5.3	100.1	0.0	PEAK	Vert
169.350	14.0	12.8	26.8	30.0	-3.2	100.1	214.1	Q.P.	Vert
183.090	11.8	11.7	23.5	30.0	-6.5	100.1	259.0	PEAK	Vert
197.550	10.4	11.7	22.1	30.0	-7.9	100.1	60.7	PEAK	Vert
200.550	13.3	11.7	25.0	30.0	-5.0	100.1	8.4	PEAK	Vert
211.490	9.6	12.5	22.1	30.0	-7.9	100.1	278.9	PEAK	Vert
225.790	11.7	13.8	25.5	30.0	-4.5	100.1	5.6	PEAK	Vert
321.000	11.4	19.3	30.7	37.0	-6.3	399.9	359.5	PEAK	Vert
362.000	10.3	20.8	31.1	37.0	-5.9	399.9	359.5	PEAK	Vert
467.770	9.8	22.5	32.3	37.0	-4.7	263.2	334.7	Q.P.	Vert

SUMMARY DATA
(RADIATED EMISSION TEST)

Model Number: PCM56R

Location: Site #3

Test Type: 56k Modem mode (highest speed mode)

Tested by: Kevin Wo

Test Results: Passed

Temperature: 21℃

Humidity: 65%RH

(The chart below shows the highest readings taken from the final data)

FREQ MHz	RAW dBuV/m	SITE CF	CORR'D dBuV/m	Q.P. LIMT (dBuV/m)	Q.P. MARGIN dB	ANT HEG (cm)	TBL POS. (deg)	Detector	NOTE
109.630	6.9	13.6	20.5	30.0	-9.5	400.0	186.0	PEAK	Horz.
141.120	6.4	13.8	20.2	30.0	-9.8	400.0	34.9	PEAK	Horz.
159.850	9.1	12.4	21.5	30.0	-8.5	394.4	112.5	PEAK	Horz.
169.340	8.8	12.4	21.2	30.0	-8.8	400.0	67.1	PEAK	Horz.
200.510	11.8	12.0	23.8	30.0	-6.2	399.9	311.1	PEAK	Horz.
211.450	8.0	12.4	20.4	30.0	-9.6	392.5	332.3	PEAK	Horz.
225.780	10.6	13.2	23.8	30.0	-6.2	400.0	5.3	PEAK	Horz.
370.000	7.6	20.2	27.8	37.0	-9.2	378.8	21.5	PEAK	Horz.
396.000	9.1	20.9	30.0	37.0	-7.0	359.7	117.7	PEAK	Horz.
467.700	10.9	21.7	32.6	37.0	-4.4	248.7	277.4	Q.P.	Horz.

APPENDIX 6

TEST FACILITY

TEST FACILITY

Location: No. 15, 14 Line, Chin Twu Chi, Lu Chu Hsiang, Taoyuan, Taiwan, R.O.C.

Description: There are two 3/10m open area test sites and two line conducted labs for final test, and one 3/10m open area test site for engineering lab. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 1992 and CISPR 22/EN 55022 requirements.

Site Filing: A site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.

Registration also was made with Voluntary Control Council for Interference (VCCI). Registration number: R-393 for Open Area Test Site #1; C-402 for Line Conducted Lab. #1.

Site Accreditation: Accredited by NEMKO (Authorization #: ELA 124) for EMC & A2LA (Certificate #: 824.01) for Emission

Measurement Uncertainty:

Radiated Emission Test	+/-4dB
Line Conducted Emission Test	+/-2dB

(This includes instrumentation calibration errors, measurement technique errors, and errors due to site anomalies.)

Ground Plane: Two conductive reference ground planes were used during the Line Conducted Emission, one in vertical and the other in horizontal. The dimensions of these ground planes are as below. The vertical ground plane was placed distancing 40 cm to the rear of the wooden test table on where the EUT and the support equipment were placed during test. The horizontal ground plane projected 50 cm beyond the footprint of the EUT system and distanced 80 cm to the wooden test table. For Radiated Emission Test, one horizontal conductive ground plane extended at least 1m beyond the periphery of the EUT and the largest measuring antenna, and covered the entire area between the EUT and the antenna. It has no holes or gaps having longitudinal dimensions larger than one-tenth of a wavelength at the highest frequency of measurement up to 1GHz.

Site #1 & Site #3 Line Conducted Test Site: Vertical ground plane (2.2m x 2.2m)
Horizontal ground plane (2.5m x 2.5m)

APPENDIX 7

TEST EQUIPMENT

MEASURING INSTRUMENT SETTING

TEST TYPE	DETECTOR	FREQUENCY RANGE	RESOLUTION BANDWIDTH	VIDEO BANDWIDTH
Conducted	Peak/Avg	10kHz-150kHz	300Hz	100kHz
Conducted	Peak/QP/Avg	150kHz-30MHz	9kHz	100kHz
Radiated	Peak	30MHz-1GHz	100kHz	100kHz
Radiated	QP	30MHz-1GHz	120kHz	120kHz
Radiated	Peak/Avg	Above 1GHz	1MHz	1MHz

Note: All readings on data pages are taken with the detector in peak mode unless otherwise stated.

UNITS OF MEASUREMENT

Measurements of radiated interference are reported in terms of dBuV/m, at a specified distance. The indicated readings on the spectrum analyzer are converted to dBuV/m by use of appropriate conversion factors. Measurements of conducted interference are reported in terms of dBuV.

TEST EQUIPMENT LIST

Instrumentation: The following list contains equipment used at C & C Laboratory, Taiwan for testing. The equipment conforms to the American National Standard Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10kHz to 2GHz.

Radiated Emission Measuring Equipment :

EQUIPMENT TYPE	*MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
Spectrum Analyzer	ADVANTEST	R3261C	71720533	12/17/1997	12/17/1998
Pre-Amplifier	HP	8447D	2944A09173	01/14/1998	01/14/1999
Receiver (20MHz-1GHz)	ROHDE& SCHWARZ	ESVS10	846285/016	12/4/1997	12/3/1998
Precision Dipole	ROHDE& SCHWARZ	HZ-12	846932/0004	06/06/1997	06/06/2000
Precision Dipole	ROHDE& SCHWARZ	HZ-13	846556/0008	06/16/1997	06/16/2000
Horn Antenna (1GHz-18GHz)	EMCO	3115	9602-4659	N/A	N/A
Bilog Antenna (30MHz-2GHz)	CHASE	CBL6112A	2179	7/3/1997	7/2/1998
Open Area Test Site	C&C	#3	N/A	01/20/1998	01/20/1999

Conducted Emission Measuring Equipment :

EQUIPMENT TYPE	*MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
Receiver (9kHz-2.75GHz)	ROHDE& SCHWARZ	ESCS30	1382	12/4/1997	12/3/1998
LISN (10kHz-100MHz)	EMCO	3825/2	9106-1810	N/A	N/A
LISN (10kHz-100MHz)	ROHDE& SCHWARZ	ESH3-Z5	848773/0014	11/19/1997	11/18/1998
Conducted Test Site	C&C	#3	N/A	---	---

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.