Report No.	A2415971
Specifications Test Method	FCC Part 15.109(g), CISPR 22, Class B ANSI C63.4 1992
Applicant address	1F, No. 21, R&D Rd. II , SBIP, Hsin-Chu, Taiwan, R.O.C.
Applicant	AboCom Systems, Inc.
Items tested Model No.	10/100 Fast Ethernet Plus 56k Fax/Modem Integrated PC Card LF560MX (Sample # A24783)
Results Date	**Compliance** (As detailed within this report) 02/26/2001 (month / day / year) (Sample received) 03/07/2001 (month / day / year) (Test)
Prepared by	Project Engineer
Authorized by	General Manager (Frank Tsai)
Issue date	*April 3, 2001* (month / day / year)
Modifications	**None**
Tested by	Training Research Co., Ltd.
Office at	2, Lane 194, Huan-Ho Street, Hsichih, Taipei Hsien 221, Taiwan
Open site at	No. 5-3, Lane 21, Yen Chiu Yuan Rd., Sec. 4, Taipei, Taiwan

Conditions of issue :

(1) ***This test report shall not be reproduced except in full, without written approval of TRC. And the test result contained within this report only relate to the sample submitted for testing.***

(2) ***This report must not be used by the client to claim product endorsement by NVLAP or any agency of U.S. Government.***

★ ***FCC ID: MQ4BPCMLM56***

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Chapter 1 Introduction

Description of EUT:

The 10/100 PCMCIA Card with 56k Fax/Modem is an Ethernet adapter, the RJ-45 connector of EUT via unshielded twisted-pair (UTP) cable, it automatically senses and switches to either 10Mbps or 100Mbps. The RJ-11 connector via the public telephone network to transmit and receive data.

Connections of EUT:

(1) Put the EUT into a notebook computer's PCMCIA interface.
(2) The RJ45 jack of EUT is connected with another LAN card installed in PC located remotely.
(3) The RJ11 jack of EUT is connected with a line cable to the PABX located remotely.

Test method:

Pretest was found that the emission of operating mode is worse than standby mode. So, The final test is made at the operating mode.

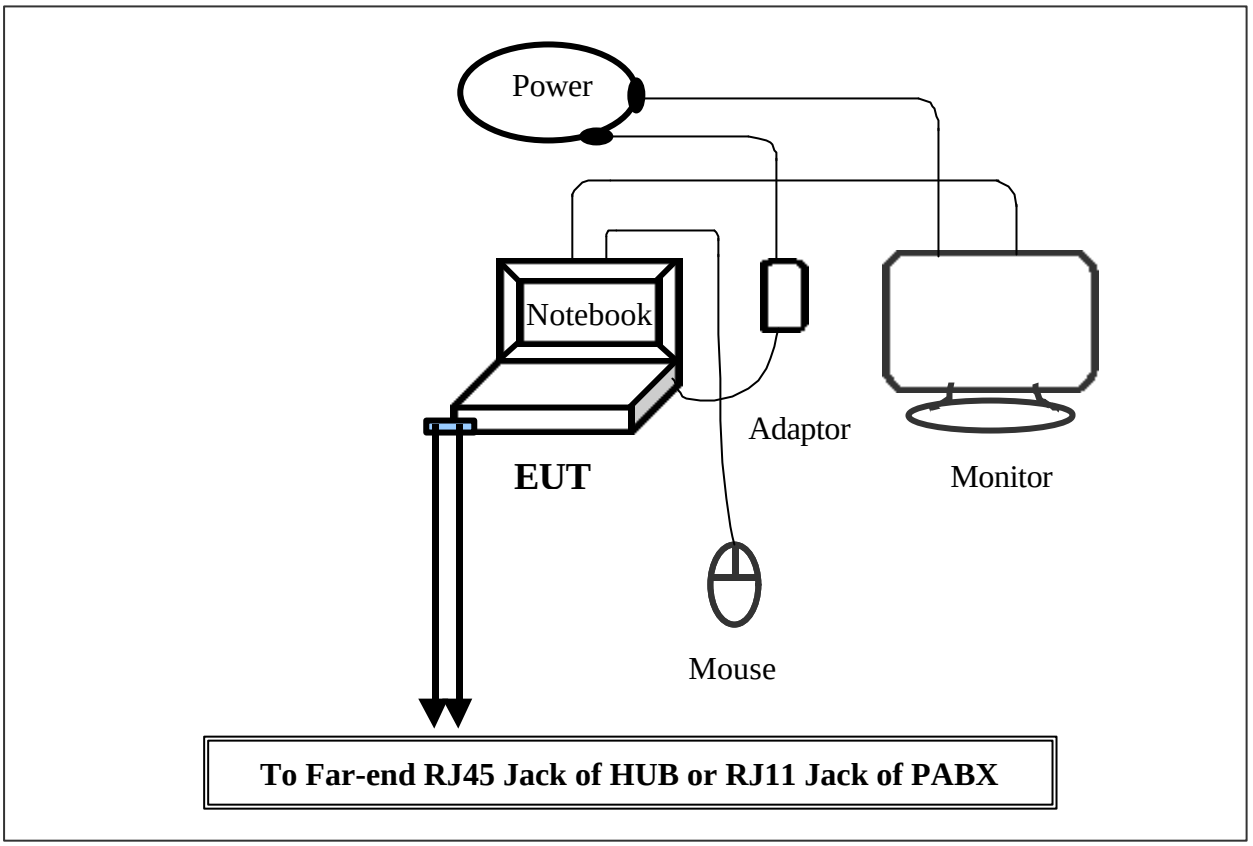
During the measurement, there are following modes tested: (1)Using RJ45 connector, "10 x 10Mbps" mode, "100×100Mbps" mode; and (2)Using RJ11 connector, the transmitting rate was set to "AUTO" which means it transmitted the test file depending on the telephone line condition, normally the operating rate is the highest speed.

During testing, the EUT was operated at "transmitting" and "receiving" mode simultaneously.

The test placement as the photographs showed is the worst case emission placed. (If the emission is close to the ambient, the resolution BW and view resolution will be reduced and the data will be recorded by detection of maximum hold peak mode.)

The testing configuration of test setup is showing in the next page.

Configuration of Test Setup



Connections:

Notebook:

*VGA Port --- a monitor

*Line Jack --- a RJ11 cable with 600 ohm terminal

*USB B Port --- a mouse

(Each port on notebook is connected with suitable device)

EUT:

*RJ45 Connector --- via a 30m long, non-shielded, with ferrite core, RJ-45 cable to another RJ45 jack of HUB that located in far-end

*RJ11 Connector --- via a 15m long, non-shielded, with ferrite core, RJ-11 cable to the PABX located remotely

List of Support Equipment

Conducted (Radiated) test:

Notebook	**:**	**IBM Think Pad X20**
Type No.	:	2662-11T
Serial No.	:	FX-11922 00/09
FCC ID	:	Doc Approved
檢磁	:	3892B565
AC Adaptor	**:**	**IBM**
Model No.	:	PA2450U
Serial No.	:	02K6654
FCC ID	:	Doc Approved
Power Core	:	Non-shielded, 180cm long, Plastic hoods, with ferrite bead
Power type	:	100 ~ 240VAC, 50 ~ 60Hz, 0.5A ~ 1.2A / 16Vdc, 4.5A

USB Mouse	**:**	**Logitech**
Model No.	:	M-BA47
Serial No.	:	LZE92250027
FCC ID	:	N/A, Doc Approved
檢磁	:	4872A220
Power type	:	Powered by Notebook Computer
Power Cable	:	Shielded, 1.5m long, Plastic hoods, No ferrite bead

HUB	**:**	**Cameo Communications, Inc.**
Model No.	:	SOHO-FH5M
FCC ID	:	N/A, Doc Approved
Power type	:	Switching
Power Cable	:	Non-shielded, 1.85m long, No ferrite bead

PABX	**:**	**King Design**
Model No.	:	KD8705-A
Serial No.	:	GV101101186
Power type	:	Switching
Power cord	:	Non-shielded, 1.8m long, no ferrite bead

Chapter 2 Conducted Emission Test

Test Condition and Setup:

All the equipment is placed and setup according to the CISPR 22.

The EUT is assembled on a wooden table, which is 80 cm high, is placed 40 cm from the back-wall, which is a vertical conducting plane. One LISN is for EUT, the other LISN is for support equipment. They are all placed on the conductive ground. The EUT's LISN connect a line switch box for selecting L1 or L2, then connect to a preamplifier and spectrum.

The spectrum scans from 150KHz to 30MHz. Conducted emission levels are detected at max. peak mode . But if the max. peak mode failed or over average limit, it will be measured by average detection mode.

While testing, there is the worst-emission plot printed at peak detection mode, and there are more than 6 highest emissions relative to limit recorded. The plot is kept as the original data, not included in test report.

List of test Instrument:

				Calibration Date	
Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
Spectrum analyzer	8591EM	H P	3619A01203	02/22/01	02/22/02
Pre-selector (<30MHz)	AMP-01	TRC	REP-001	08/09/00	08/09/01
LISN (EUT)	TRC LISN01	TRC	LISN-01	08/21/00	08/21/01
LISN (Support E.)	LISN01	TRC	9912-01, 02	12/02/00	12/02/01

The level of confidence of 95%, the uncertainty of measurement of conducted emission is ± 2.4 dB.

Test Result: Pass (Appendix A)

Conducted Test Placement: (Photographs) (Test Mode: Modem)

Conducted Test Placement: (Photographs) (Test Mode: LAN)

Chapter 3 Radiated Emission Test

Test Condition and Setup :

Pretest: Prior to the final test (OATS test), the EUT is placed in a shielded enclosure, and scan from 30MHz to 1GHz. This is done to ensure the radiation is exactly emitted from the EUT. ***Final test :*** Final radiation measurements is made on a **10 – meter,** open-field test site. The EUT is placed on a nonconductive table, which is 0.8m height, the top surface is 1.0 x 1.5 meter. All placement is according to CISPR 22.

The spectrum is examined from 30MHz to 10GHz measured by HP spectrum.

The range Antenna is used to measure frequency from 30MHz to 1GHz.The final test is used the spectrum analyzer. Measure more than six top marked frequencies generated form pretest by computer step by step at each frequency. The EUT is rotated 360 degrees, and antenna is raised and lowered from 1 to 4 meters to find the maximum emission levels. The antenna is used with both horizontal and vertical polarization. Appropriated preamplifier which is made by TRC is used for improving sensitivity and precautions is taken to avoid overloading .The spectrum analyzer's 6dB bandwidth is set to 120 K Hz, and the EUT is measured at quasi-peak mode. If the emission is close to the frequency band of ambient, the tester will recheck the data and the corrected data will be written in the test data sheet. If the emission is just within the ambient, the data from shielded room will be taken as the final data.

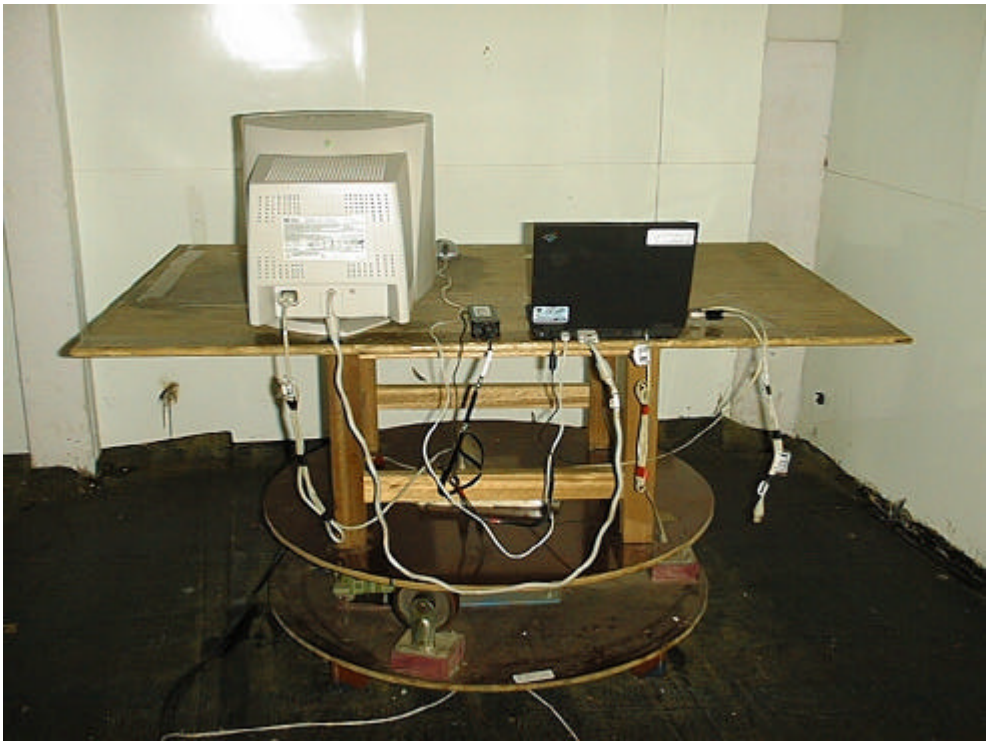
List of test Instrument :

				Calibration Date	
Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
Spectrum analyzer	8591EM	H P	3619A01203	02/22/01	02/22/02
Pre-selector (>30MHz)	AMP-01	TRC	REP-001	10/02/00	10/02/01
Spectrum analyzer	8568B	H P	3004A18617	05/28/00	05/28/01
Quasi-peak Adapter	85650A	H P	2521A00984	05/31/00	05/31/01
RF Pre-selector	85685A	H P	2947A01011	06/01/00	06/01/01
RF Pre-selector	AMP-01	TRC	REP-002	10/02/00	10/02/01
Antenna (30M-1.5GHz)	VULB 9160	M.E.	3064	06/03/00	06/03/01
Antenna (30M-2GHz)	3142	EMCO	9610-1094	10/02/00	10/02/01
Open test side (Antenna, Amplify, cable calibrated together)				05/20/00	05/20/01

The level of confidence of 95% , the uncertainty of measurement of radiated emission is ± 4.96 dB .

Test Result : Pass (Appendix B)

Radiated Test Placement: (Photographs) (Test Mode: Modem)



Radiated Test Placement: (Photographs) (Test Mode: LAN)

Appendix A

Conducted Emission Test Result: (Test Mode --- LAN, 10 x 10Mbps)

Testing room : Temperature : 21 ° C Humidity : 67 % RH

Line 1

Frequency (KHz)	*READING AMPLITUDE*			*LIMIT*		*Margin (dB)*
	Peak (dBmV/m)	*Quasi-Peak (dBmV/m)*	*Average (dBmV/m)*	*Quasi-Peak (dBmV/m)*	*Average (dBmV/m)*	
347.00	48.52	***.**	***.**	60.37	50.37	-1.85
359.00	48.36	***.**	***.**	60.03	50.03	-1.67
371.00	48.70	***.**	***.**	59.69	49.69	-0.99
385.00	48.57	***.**	***.**	59.29	49.29	-0.72
444.00	45.69	***.**	***.**	57.60	47.60	-1.91
582.00	45.25	***.**	***.**	56.00	46.00	-0.75
680.00	44.48	***.**	***.**	56.00	46.00	-1.52
697.00	45.63	***.**	***.**	56.00	46.00	-0.37
754.00	46.10	40.90	21.49	56.00	46.00	-5.10
880.00	45.91	***.**	***.**	56.00	46.00	-0.09

Line 2

Frequency (KHz)	*READING AMPLITUDE*			*LIMIT*		*Margin (dB)*
	Peak (dBmV/m)	*Quasi-Peak (dBmV/m)*	*Average (dBmV/m)*	*Quasi-Peak (dBmV/m)*	*Average (dBmV/m)*	
392.00	46.51	***.**	***.**	59.09	49.09	-2.58
408.00	46.34	***.**	***.**	58.63	48.63	-2.29
441.00	44.41	***.**	***.**	57.69	47.69	-3.28
744.00	42.55	***.**	***.**	56.00	46.00	-3.45
773.00	43.12	***.**	***.**	56.00	46.00	-2.88
788.00	43.51	***.**	***.**	56.00	46.00	-2.49
808.00	44.06	***.**	***.**	56.00	46.00	-1.94
916.00	43.39	***.**	***.**	56.00	46.00	-2.61
1574.00	45.12	***.**	***.**	56.00	46.00	-0.88
1635.00	44.62	***.**	***.**	56.00	46.00	-1.38

****The reading amplitudes are all under limit.***

Conducted Emission Test Result: (Test Mode --- LAN, 100 x 100Mbps)

Testing room : Temperature : 21 ° C Humidity : 67 % RH

Line 1

Frequency (KHz)	*READING AMPLITUDE*			*LIMIT*		*Margin (dB)*
	Peak (dBmV/m)	*Quasi-Peak (dBmV/m)*	*Average (dBmV/m)*	*Quasi-Peak (dBmV/m)*	*Average (dBmV/m)*	
515.00	41.39	***.**	***.**	56.00	46.00	-4.61
538.00	41.24	***.**	***.**	56.00	46.00	-4.76
553.00	43.81	***.**	***.**	56.00	46.00	-2.19
582.00	45.55	***.**	***.**	56.00	46.00	-0.45
612.00	45.67	***.**	***.**	56.00	46.00	-0.33
675.00	41.43	***.**	***.**	56.00	46.00	-4.57
759.00	41.42	***.**	***.**	56.00	46.00	-4.58
880.00	41.23	***.**	***.**	56.00	46.00	-4.77
904.00	41.57	***.**	***.**	56.00	46.00	-4.43
1156.00	41.89	***.**	***.**	56.00	46.00	-4.11

Line 2

Frequency (KHz)	*READING AMPLITUDE*			*LIMIT*		*Margin (dB)*
	Peak (dBmV/m)	*Quasi-Peak (dBmV/m)*	*Average (dBmV/m)*	*Quasi-Peak (dBmV/m)*	*Average (dBmV/m)*	
556.00	40.67	***.**	***.**	56.00	46.00	-5.33
590.00	44.61	***.**	***.**	56.00	46.00	-1.39
612.00	43.55	***.**	***.**	56.00	46.00	-2.45
671.00	40.14	***.**	***.**	56.00	46.00	-5.86
759.00	40.60	***.**	***.**	56.00	46.00	-5.40
862.00	40.16	***.**	***.**	56.00	46.00	-5.84
1468.00	40.02	***.**	***.**	56.00	46.00	-5.98
1680.00	40.20	***.**	***.**	56.00	46.00	-5.80
1780.00	40.27	***.**	***.**	56.00	46.00	-5.73
11560.00	43.86	***.**	***.**	60.00	50.00	-6.14

****The reading amplitudes are all under limit.***

Conducted Emission Test Result: (Test Mode --- Modem)

Testing room : Temperature : 21 ° C Humidity : 67 % RH

Line 1

Frequency (KHz)	*READING AMPLITUDE*			*LIMIT*		*Margin (dB)*
	Peak (dBmV/m)	*Quasi-Peak (dBmV/m)*	*Average (dBmV/m)*	*Quasi-Peak (dBmV/m)*	*Average (dBmV/m)*	
347.00	48.21	***.**	***.**	60.37	50.37	-2.16
368.00	48.15	***.**	***.**	59.77	49.77	-1.62
380.00	48.53	***.**	***.**	59.43	49.43	-0.90
392.00	47.55	***.**	***.**	59.09	49.09	-1.54
441.00	46.03	***.**	***.**	57.69	47.69	-1.66
654.00	44.23	***.**	***.**	56.00	46.00	-1.77
697.00	43.91	***.**	***.**	56.00	46.00	-2.09
719.00	44.25	***.**	***.**	56.00	46.00	-1.75
734.00	45.10	***.**	***.**	56.00	46.00	-0.90
764.00	45.39	***.**	***.**	56.00	46.00	-0.61

Line 2

Frequency (KHz)	*READING AMPLITUDE*			*LIMIT*		*Margin (dB)*
	Peak (dBmV/m)	*Quasi-Peak (dBmV/m)*	*Average (dBmV/m)*	*Quasi-Peak (dBmV/m)*	*Average (dBmV/m)*	
347.00	45.89	***.**	***.**	60.37	50.37	-4.48
452.00	43.09	***.**	***.**	57.37	47.37	-4.28
688.00	42.17	***.**	***.**	56.00	46.00	-3.83
724.00	42.90	***.**	***.**	56.00	46.00	-3.10
739.00	42.91	***.**	***.**	56.00	46.00	-3.09
898.00	41.52	***.**	***.**	56.00	46.00	-4.48
1419.00	41.89	***.**	***.**	56.00	46.00	-4.11
1507.00	42.50	***.**	***.**	56.00	46.00	-3.50
1792.00	42.38	***.**	***.**	56.00	46.00	-3.62
1896.00	42.38	***.**	***.**	56.00	46.00	-3.62

****The reading amplitudes are all under limit.***

Appendix B

Radiated Emission Test Result: (Test Mode --- LAN, 100 x 100Mbps, Horizontal)

Test Conditions:

Testing room : Temperature : 18 ° C Humidity : 69 % RH

Testing site : Temperature : 16 ° C Humidity : 81 % RH

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B Limit	Margin
MHz	dBμV	m	degree	dB/m	dBμV/m	dBμV/m	dB
85.910	28.60	4.00	86	-15.82	12.78	30.00	-17.22
109.050	36.70	4.00	49	-13.58	23.12	30.00	-6.88
120.000	31.90	4.00	155	-12.66	19.24	30.00	-10.76
225.000	31.80	4.00	145	-12.91	18.89	30.00	-11.11
399.010	30.90	1.00	88	-5.84	25.06	37.00	-11.94
425.000	30.30	1.00	2	-4.88	25.42	37.00	-11.58
450.000	32.10	2.55	8	-4.05	28.05	37.00	-8.95
466.520	25.10	2.55	356	-3.44	21.66	37.00	-15.34
500.010	26.50	1.00	0	-3.06	23.44	37.00	-13.56
600.000	27.50	4.00	16	-0.22	27.28	37.00	-9.72
650.000	24.00	1.00	30	0.75	24.75	37.00	-12.25
700.000	28.90	4.00	136	1.95	30.85	37.00	-6.15
856.460	24.50	1.00	136	6.15	30.65	37.00	-6.35

Note:

1.Margin = Amplitude - limit, *if margin is minus means under limit.*

2.Corrected Amplitude = Reading Amplitude + Correction Factors

3.Correction factor = Antenna factor + (Cable Loss – Amplitude gain)

(For example : 30MHz correction factor = 15.5 + (–15.26) = 0.24 dB/m)

Radiated Emission Test Result: (Test Mode --- LAN, 100 x 100Mbps, Vertical)

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B Limit	Margin
MHz	dBμV	m	degree	dB/m	dBμV/m	dBμV/m	dB
75.000	35.90	1.00	106	-16.20	19.70	30.00	-10.30
85.910	38.40	2.56	0	-15.82	22.58	30.00	-7.42
96.930	39.40	2.56	178	-14.63	24.77	30.00	-5.23
117.980	36.10	2.56	21	-12.83	23.27	30.00	-6.73
150.000	34.60	1.00	142	-10.56	24.04	30.00	-5.96
165.980	36.20	1.00	262	-11.06	25.14	30.00	-4.86
175.000	33.90	2.56	70	-11.92	21.98	30.00	-8.02
193.250	34.10	2.56	270	-13.29	20.81	30.00	-9.19
221.190	38.80	2.56	133	-13.21	25.59	30.00	-4.41
250.000	35.80	2.56	127	-11.40	24.40	37.00	-12.60
300.000	32.20	1.00	311	-8.99	23.21	37.00	-13.79
***							

Radiated Emission Test Result: (Test Mode --- Modem, Horizontal)

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B Limit	Margin
MHz	dBμV	m	degree	dB/m	dBμV/m	dBμV/m	dB
109.040	34.90	4.00	33	-13.58	21.32	30.00	-8.68
120.000	29.90	4.00	210	-12.66	17.24	30.00	-12.76
147.500	26.60	4.00	75	-10.77	15.83	30.00	-14.17
165.980	27.60	4.00	297	-11.06	16.54	30.00	-13.46
186.000	36.50	4.00	195	-12.87	23.63	30.00	-6.37
298.680	27.70	4.00	303	-9.02	18.68	37.00	-18.32
336.030	30.30	2.55	9	-8.00	22.30	37.00	-14.70
400.010	29.60	1.00	309	-5.82	23.78	37.00	-13.22
450.010	29.60	2.55	0	-4.05	25.55	37.00	-11.45
500.010	27.70	1.00	16	-3.06	24.64	37.00	-12.36
699.250	23.40	4.00	200	1.94	25.34	37.00	-11.66
856.410	24.10	4.00	352	6.15	30.25	37.00	-6.75

Radiated Emission Test Result: (Test Mode --- Modem, Vertical)

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B Limit	Margin
MHz	dBμV	m	degree	dB/m	dBμV/m	dBμV/m	dB
78.170	40.80	4.00	94	-16.77	24.03	30.00	-5.97
85.920	39.90	2.56	266	-16.00	23.90	30.00	-6.10
96.930	36.30	4.00	164	-14.63	21.67	30.00	-8.33
109.040	34.80	4.00	26	-13.58	21.22	30.00	-8.78
120.000	33.80	2.55	5	-12.90	20.90	30.00	-9.10
122.890	33.00	4.00	267	-12.61	20.39	30.00	-9.61
147.530	30.90	1.00	248	-10.77	20.13	30.00	-9.87
165.880	32.40	1.00	182	-11.05	21.35	30.00	-8.65
221.190	36.50	4.00	41	-13.21	23.29	30.00	-6.71
294.910	33.30	1.00	267	-9.12	24.18	37.00	-12.82
650.010	23.00	2.55	37	0.75	23.75	37.00	-13.25
871.080	23.50	2.56	50	6.35	29.85	37.00	-7.15