FCC ID: NRYV90-IMD

EMC

TEST REPORT

REPORT NO. : F87073002
MODEL NO. : V90-IMD
DATE OF TEST : July 30, 1998

PREPARED FOR : NETRONICS INC.

ADDRESS : 11F NO. 1 SEC. 4, NANKING E. ROAD,
TAIPEI, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION

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12F, NO.1, SEC.4, NAN-KING EAST RD.,
TAIPEI, TAIWAN, R.O.C.

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1. CERTIFICATION

Issue Date: Aug. 18, 1998

Product	:	MODEM
Trade Name	:	NETRONICS
Model No.	:	V90-IMD
Applicant	:	NETRONICS INC.
Standard	:	FCC Part 15, Subpart B, Class B ANSI C63.4-1992 CISPR 22:1993+A1+A2

We hereby certify that one sample of the designation has been tested in our facility on July 30, 1998. The test record, data evaluation and Equipment Under Test (EUT) configurations represent herein are true and accurate representation of the measurements of the sample's EMC characteristics under the conditions herein specified.

The test results show that the EUT as described in this report is in compliance with the Class B limits of conducted and radiated emission of applicable standards.

TESTED BY: J. W. KUO , DATE: 8/18/98
(J. W. Kuo)

CHECKED BY: Ariel Hsieh , DATE: 8/18/98
(Ariel Hsieh)

APPROVED BY: Mike Su , DATE: 8/18/98
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	MODEM
Model No.	:	V90-IMD
Power Supply Type	:	Linear (from power adapter)
Power Cord	:	Nonshielded (1.8m)
Data Cable	:	Shielded (1.5m)

Note: The EUT is a modem with baud rate of 56 Kbps.

It was tested with a Netronics power adapter, model: MW48-0901000, which is a 2 pin direct-plug-in type. Its rating: Input: AC 110V, 60 Hz; Output: 9 Vac, 1A.

There is a ferrite core on the interface cable of EUT which will be sold together with the EUT.

For more detailed features description, please refer to ATTACHMENT 1 – TECHNICAL DESCRIPTION OF EUT and User's Manual.

2.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories are used to form representative test configuration during the tests.

No	Product	Brand	Model No.	FCC ID	I/O Cable
1.	PERSONAL COMPUTER	HP	D4579A	FCC DoC Approved	Nonshielded Power (1.8m)
2.	COLOR MONITOR	ADI	PD-595	FCC DoC Approved	Shielded Signal (1.2m) Nonshielded Power (1.8m)
3.	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (1.2m) Nonshielded Power (2.0m)
4.	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded Signal (1.4m)
5.	TELEPHONE	DAISHO	DS-03	N/A	Shielded Signal (2.8m)
6.	MOUSE	COMPAQ	M-S28	DZL210472	Shielded Signal (1.8m)
7.	MICROPHONE	CAROL	MUD-329	N/A	Shielded Signal (2.8m)
8.	EARPHONE	GAMMA	LH115	N/A	Shielded Signal (2.4m)
9.	VGA CARD	DIAMOND	STEALTH 64 VIDEO	FTUPCI968524	N/A
10.	PERSONAL COMPUTER	ZENITH	JDK-8371-QJ	E8H95H4P	Nonshielded Power (1.8m)
11.	COLOR MONITOR	ADI	PD-959	FCC DoC Approved	Shielded Signal (1.2m) Nonshielded Power (1.8m)
12.	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded Signal (1.4m)
13.	MOUSE	HP	C1413A	B94C1413X	Shielded Signal (2.8m)
14.	MODEM	NETRONICS	TAD-56KRE	NRYTAD-56KRE	Shielded Signal (1.5m) Nonshielded Power (1.9m)

Note: Support units 1-9 were set up as the SERVER PC system and communicated with units 10-14 which acted as WORKSTATION and partners of communication system via a telephone cable (10m).

2.3 TEST METHODOLOGY AND CONFIGURATION

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 1992. Radiated testing was performed at an antenna to EUT distance of 10 m on an open area test site.

Please refer to the photos of test configuration in Item 5.

3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8590L	3544A01176	April 28, 1999
HP Preamplifier	8447D	2944A08485	Oct. 28, 1998
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 22, 1998
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE BILOG Antenna	CBL6112A	2221	Aug. 10, 1999
EMCO Turn Table	1060	1115	N/A
SHOSHIN Tower	AP-4701	A6Y005	N/A
Open Field Test Site	Site 5	ADT-R05	Aug. 18, 1998

Note: 1. The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESHS30	828109/007	July 22, 1999
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	892107/003	July 20, 1999
EMCO L.I.S.N.	3825/2	9504-2359	July 20, 1999
Shielded Room	Site 3	ADT-C03	N/A

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION

LIMIT OF RADIATED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (at 10m) dBuV/m	Class B (at 10m) dBuV/m
30 - 230	40	30
230 - 1000	47	37

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
Above 1000	300	49.5	500	54.0

Note: (1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

LIMIT OF CONDUCTED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Note: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Frequency Range	:	0.15 - 30 MHz (Conducted Emission)
		30 - 1000 MHz (Radiated Emission)
Input Voltage	:	120 Vac, 60 Hz
Temperature	:	25 ℃
Humidity	:	43 %
Atmospheric Pressure	:	997 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -17.8 dB at 0.402 MHz Minimum passing margin of radiated emission: -2.5 dB at 141.13 MHz

Note: The highest emission levels were found at highest transceiving speed.

4.2 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. Server PC and WORKSTATION run a test program to enable all functions.
3. Server PC transmits messages to and receives messages from the WORKSTATION via the telephone cable connected to EUT.
4. Server PC sends "H" messages to monitor and monitor displays "H" patterns on screen.
5. Server PC sends "H" messages to printer, and then the printer prints them on paper.
6. Repeat steps 3-6.

4.3 TEST DATA OF CONDUCTED EMISSION

EUT: **MODEM** MODEL: **V90-IMD**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL: J. W. KUO

Freq.	L Level		N Level		Limit		Margin [dB (μV)]			
[MHz]	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.153	45.70	-	43.00	-	65.84	55.84	-20.1	-	-22.8	-
0.402	36.00	-	40.00	-	57.81	47.81	-21.8	-	-17.8	-
2.379	15.40	-	15.00	-	56.00	46.00	-40.6	-	-41.0	-
4.167	16.70	-	16.00	-	56.00	46.00	-39.3	-	-40.0	-
7.268	23.00	-	22.00	-	60.00	50.00	-37.0	-	-38.0	-
28.223	23.90	-	23.00	-	60.00	50.00	-36.1	-	-37.0	-

Remarks:
1. "*": Undetectable
2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
3. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
4. The emission levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value

ADT CO. Shielded Room 3

CISPR 22 CLASS B

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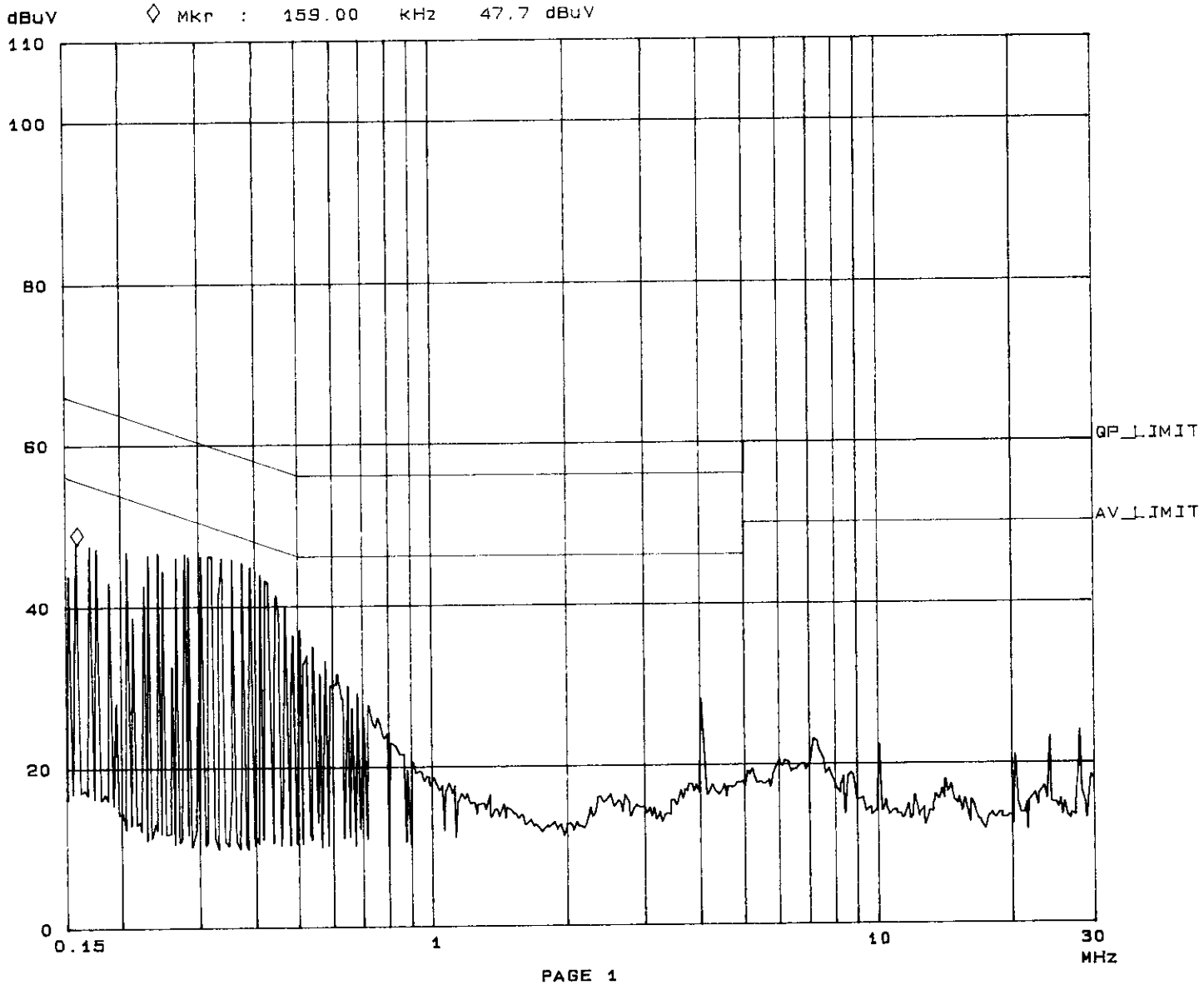
Tested by J.W. KUO

EUT: V90-IMD
Test Spec: LISN : L
Comment: 110 AC / 60HZ

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	450k	3k	10k	PK	1ms	10dBLN	OFF	60dB
450k	5M	3k	10k	PK	1ms	10dBLN	OFF	60dB
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	60dB



ADT CO. Shielded Room 3
CISPR 22 CLASS B

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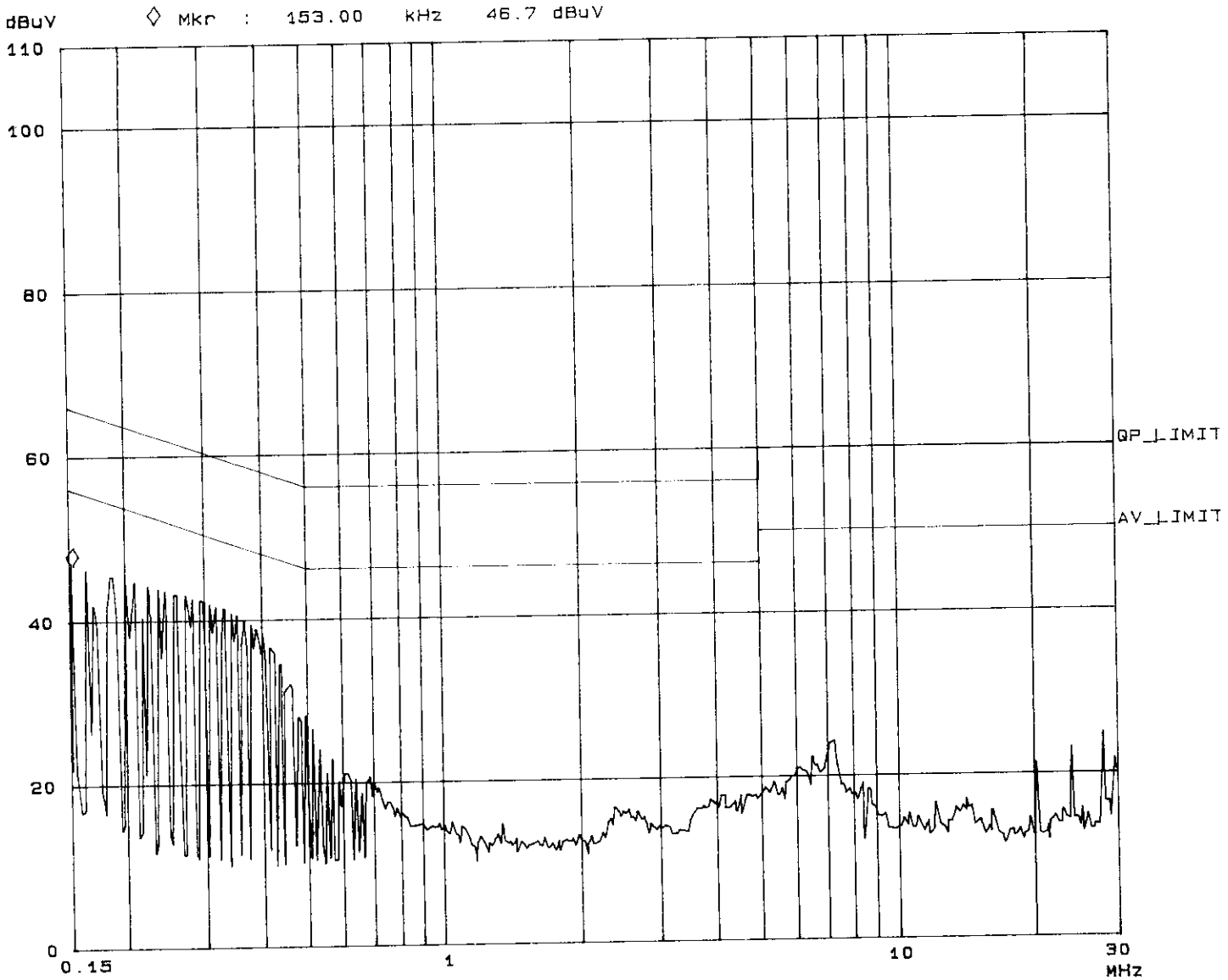
Tested by J.W. KUO

EUT: V90-IMD
Test Spec: LISN : N
Comment: 110 AC / 60HZ

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	450k	3k	10k	PK	1ms	10dBLN	OFF	60dB
450k	5M	3k	10k	PK	1ms	10dBLN	OFF	60dB
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	60dB



4.4 TEST DATA OF RADIATED EMISSION

EUT: **MODEM** MODEL: **V90-IMD**

ANTENNA: CHASE BILOG CBL6112A POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak 6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

TEST PERSONNEL: J. W. KUO

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
56.48	8.8	6.8	15.6	30.0	-14.4
84.68	9.5	7.4	16.9	30.0	-13.1
141.13	14.1	13.4	27.5	30.0	-2.5
169.37	12.2	13.2	25.4	30.0	-4.6
197.60	12.9	12.3	25.2	30.0	-4.8
225.80	14.7	11.9	26.6	30.0	-3.4
254.03	17.2	11.8	29.0	37.0	-8.0
338.72	18.1	14.3	32.4	37.0	-4.6
508.08	23.0	6.9	29.9	37.0	-7.1
620.96	25.3	7.4	32.7	37.0	-4.3
649.19	26.5	7.5	34.0	37.0	-3.0
677.42	26.1	7.6	33.7	37.0	-3.3

REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB/m) +Meter Reading (dBuV).
2. Correction Factor (dB/m) = Ant. Factor (dB/m)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value

FCC ID: NRYV90-IMD

TEST DATA OF RADIATED EMISSION

EUT: **MODEM** MODEL: **V90-IMD**

ANTENNA: CHASE BILOG CBL6112A POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak 6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

TEST PERSONNEL: J. W. Kuo

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
56.47	8.5	16.7	25.2	30.0	-4.8
84.67	8.6	14.5	23.1	30.0	-6.9
141.16	14.5	12.5	27.0	30.0	-3.0
169.37	12.2	14.6	26.8	30.0	-3.2
197.59	13.4	10.5	23.9	30.0	-6.1
225.82	15.1	7.9	23.0	30.0	-7.0
254.06	16.7	11.4	28.1	37.0	-8.9
508.07	22.8	8.6	31.4	37.0	-5.6
620.97	24.9	6.5	31.4	37.0	-5.6
649.20	25.7	6.7	32.4	37.0	-4.6
677.43	25.8	4.6	30.4	37.0	-6.6

REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB/m) +Meter Reading (dBuV).
2. Correction Factor (dB/m) = Ant. Factor (dB/m)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value

6. ATTACHMENT I -TECHNICAL DESCRIPTION OF EUT

SPECIFICATIONS:

- Data modem
  - –ITU-T V.90 and K56flex
  - – V.34 (33.6 kbps) , V.32 bis, V.32, V.22 bis, V22, V.23, and V.21; Bell 212A and 103
  - –V.42 LAPM, MNP 2-4, and MNP 10 error correction
  - –V.42 bis and MNP 5 data compression
  - –MNP 10EC™ enhanced cellular performance
- Fax modem send and receive rates up to 14400 bps
  - –V.17, V.29, V.27 ter, and V.21 chennel 2
  - –V.80 synchronous access mode supports host-based communication protocols
- Voice/TAM mode
- AudioSpan (simultaneous audio/voice and data)
  - –ITU-T V.61 modulation (4.8 kbps data plus audio)
  - –Handset, headset, or half-duplex speakerphone
- Full-duplex speakerphone (FDSP) mode
  - –Acoustic and line echo cancellation
  - –Microphone gain and muting
  - –Speaker volume control and muting
- Communication software compatible AT command sets
  - – Data, fax class 1, fax class 2, voice / TAM
  - – Speakerphone
- NVRAM directory and stored profiles
- Flash memory support
- Serial ITU-T V.24 (EIA/TIA-232-E)
- Supports Serial PnP interface per Plug and Play External COM Device Specification, Rev 1.00
- Caller ID support
- On line timer (4-digit 7-segment display)
  - – Reset to 00:00 when off-hook
  - – Start to count when carrier detected
  - – Stop count when on-hook