Korea Technology Institute Co., Ltd.

Certificate of Compliance

Test Report No.:	KTI01F0202		
Registration No.:	99058		
Applicant:	Korea One Telecommunication Technology, Inc.		
Applicant Address:	Suit 305 Daeha Building, 680 Yeoksam-Dong Kangnam-Gu, Seoul, Korea		
Product:	ADSL Modem		
FCC ID:	PG3ES-LINKKCP1000	Model No.	Es-Link KCP1000
Receipt No.:	KTI20010130	Date of receipt:	Jan, 17, 2001
Date of Issue:	Feb, 12, 2001		
Testing location	Korea Technology Institute Co., Ltd. 51-19, Sanglim3-Ri, Docheok-Myeun, Gwangju-Shi, Gyeungki-Do, Korea		
Test Standards:	ANSI. C63.4 : 1992		
Rule Parts:	FCC Part 15, Subpart B		
Equipment Class:	Class B		
Test Result:	The above mentioned product has been tested and passed.		

Πρεπαρε βψ: ϑ. Η. Λεε	Τεστεδ βψ: Σ. Β. Κιμ/ Ενγινεερ	Αππροϖεδ βψ: Γ. Χ. Μιν/ Πρεσιδεντ
Signature Date	**Signature Date**	**Signature Date**

Other Aspects :	
Abbreviations :	OK, Pass=passed Fail=failed N/A=not applicable

- This test report is not permitted to copy partly without our permission.
- This test result is dependent on only equipment to be used.
- This test result is based on a single evaluation of one sample of the above mentioned.
- This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S Government.
- We certify this test report has been based on the measurement standards that is traceable to the national or international standards.

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1. General

This equipment has been shown to be capable of compliance with the applicable technical standards and was tested in accordance with the measurement procedures as indicated in this report.

We attest to the accuracy of data. All measurements reported herein were performed by Korea Technology Institute Co., LTD. And were made under Chief Engineer's supervision.
We assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

2. Test Site

Korea Technology Institute Co., LTD

2.1 Location

51-19, Sanglim3-Ri, Docheok-Myeun, Gwangju-Shi, Gyeungki-Do, Korea

The Test Site is in compliance with ANSI C63.4/1992 for measurement of radio Interference.

2.2 List of Test and Measurement Instruments

Table 1 : List of Test and Measurement Equipment

• Conducted Emissions

Kind of Equipment **Type** **S/N** **Calibrated until**
Spectrum Analyzer R3261C 61720427 10.2001
Field Strength Meter ESPC 832827/011 11.2001
LISN ESH3-Z5 8254601019 10.2001
LISN KNW407 8-1097-7 11.2001
Pulse limiter ESH3Z2 357.8810.52 11.2001
Conducted Cable N/A N/A 11.2001

• Radiated Emissions

Kind of Equipment **Type** **S/N** **Calibrated until**
Field Strength Meter ESPC 832827/011 11.2001
Spectrum Analyzer R3361A 11730187 11.2001
Log Periodic Antenna 3146 9105-1343 11.2001

3. Description of the tested samples

The EUT is ADSL Modem

3.1 Rating and Physical Characteristics

- Transmission Speed: Full-rate Downstream 8Mbps, Upstream 1Mbps
  G.Lite Downstream 1.5Mbps, Upstream 512Mbps
- Transmission Distance: 18,000ft(approximately 5.5km)
- Transmission Standards: Full ppp (RFC2364), Multi protocol (RFC1483)
- Interface Standards: Internal PCI
- Chip Set: Conexant chipset
- Protocol: ANSI T1,143 Issue2
  ITU-T G.992.1 (G.DMT)
  ITU-T G.992.2 (G.Lite)
- Size: 13cm×8.5cm

3.2 Submitted Documents

User's Guide
Block Diagram

4. Measurement Conditions

Testing Input Voltage : AC 220V, 60Hz

4.1 Modes of Operation

The EUT was in the following operation mode during all testing;
Prior to a measurement, the ADSL Modem shall be operated until stabilization has been reached.

4.2 Additional Equipment

DEVICE TYPE	**Manufacturer**	**M/N**	**S/N**	**FCC ID**
PC	Atech Co., Ltd.	Att	None	-
Monitor	Samsung Electonics	750P(T)	P015H2GN503475	-
Keyboard	Solid Year Co., Ltd	TRI-270	910090345	-
Mouse	Microsoft	ITE78CJ	1048611-5	-
Telephone	Tae Heung presision	TCP-2500	930900715	-

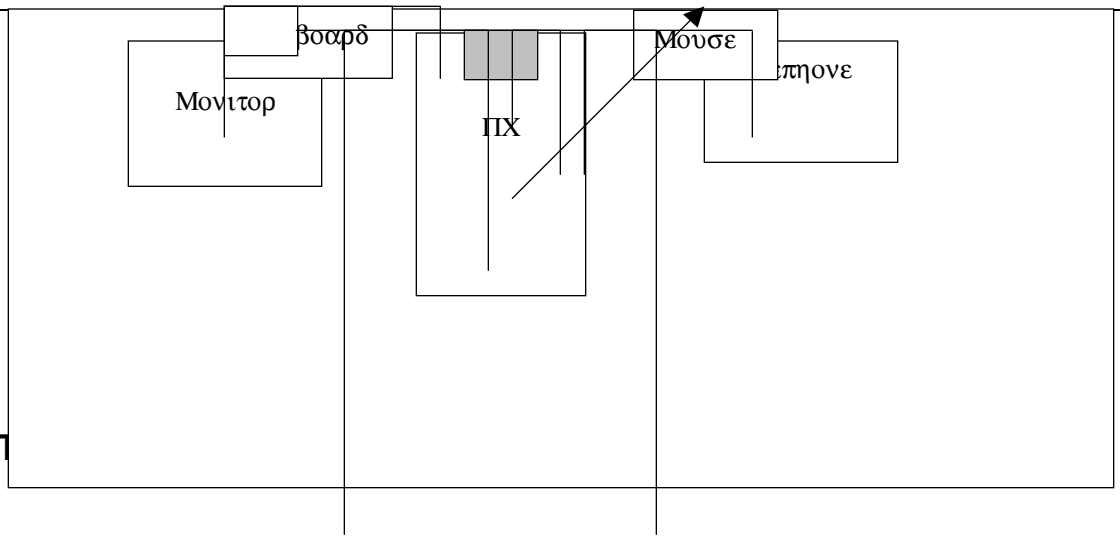
4.3 Uncertainty

1) Radiated disturbance

UC (Combined standard Uncertainty) = ± 1.8dB
Expanded uncertainty U=KUc
K = 2
4 U = ± 3.6dB

2) Conducted disturbance

UC = ± 0.88dB
U = KUc=2xUc = ± 1.8dB



4.4 T

600ohm Termination(RJ-45)

EUT

5. EMISSION Test

5.1 Conducted Emissions

Result : Pass

The line-conducted facility is located inside a 2.3M x 3.5M x 5.5M shielded closure.
The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 605-05.
A 1m x 1.5m wooden table 80cm. High is placed 80cm away from the vertical wall and 1.5m away from the side wall of the shielded room. R&S Model ESH3-Z5(10kHz-30MHz)
50ohm/50 uH line-Impedance Stabilization Networks(LISN) are bonded to the shielded room.
The EUT is powered from the R&S LISN and the support equipment is powered from the Kyoritsu LISN. Power to the LISN are filtered by a high-current high-insertion loss shield enclosures power line filters(100dB 14kHz-1Ghz).
The purpose of the filter is to attenuate ambient signal interference and this filter is also bonded to the shielded enclosure.
All electrical cables are shielded by braided tinned copper zipper tubing with inner diameter of 1/2".
If the EUT is a DC-Powered device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the Kyoritsu LISN.
All interconnecting cables more than 1 meter were shortened by non-inductive bundling (serpentine fashion) to a 1-meter length.
Sufficient time for the EUT, Support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT.
The spectrum was scanned from 450kHz to 30MHz with 100sec. sweep time.
The frequency producing the maximum level was reexamined using EMI field Intensity meter (ESPC)and Quasi-Peak adapter. The detector function was set to CISPR Q.P. mode.
The bandwidth of the receiver was set to 10kHZ. The EUT, support equipment, and interconnecting each emission was maximized by: switching power lines; varying the mode of operation or resolution; clock or data exchange speed; if applicable; whichever determined the worst-case emission.
Photographs of the worst-case emission can be seen in photograph of conducted test.
Each EME reported was calibrated using self-calibrating mode.

Figure 1 : Spectral Diagram, LINE – PE

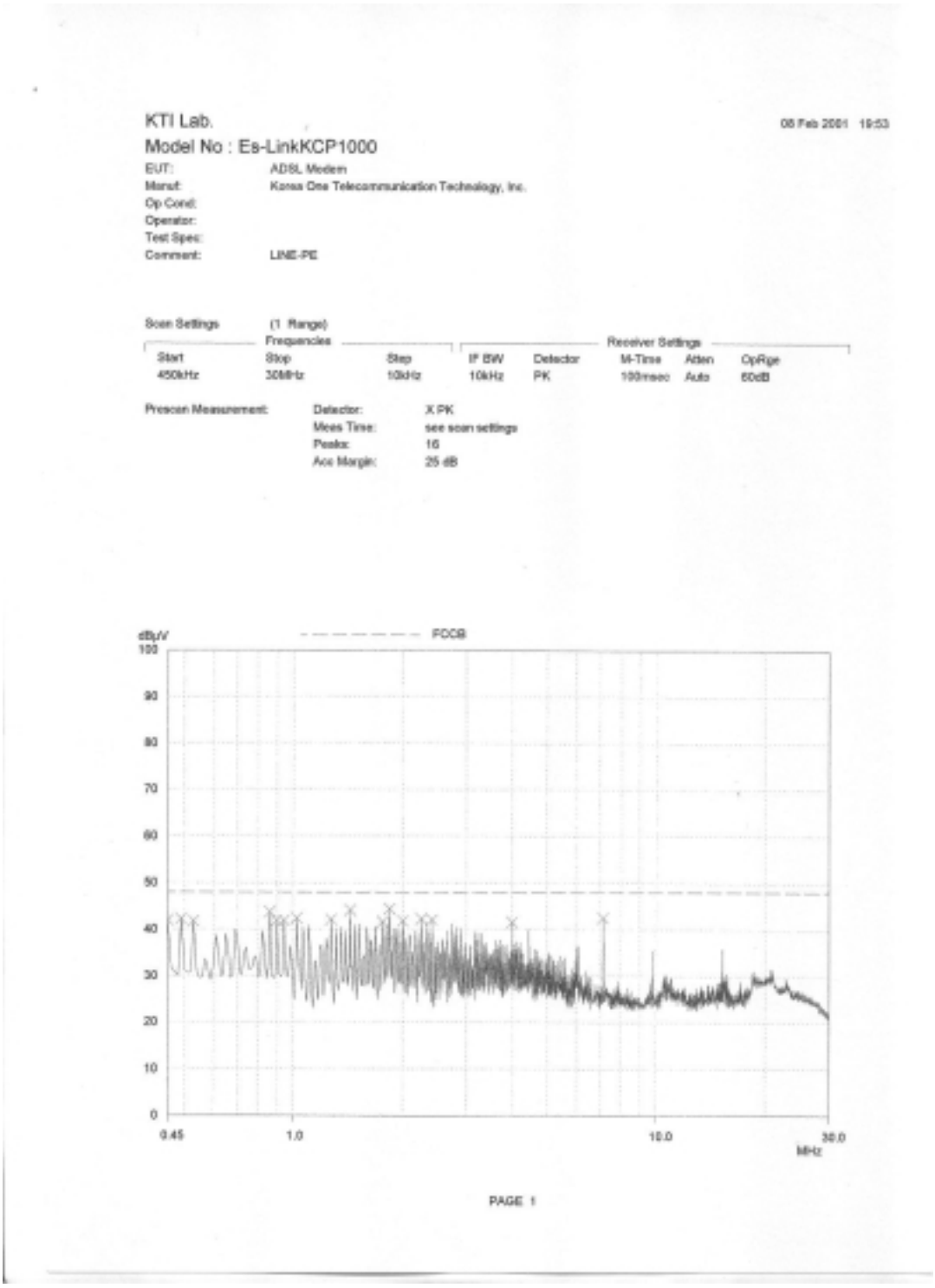


Figure 2 : Spectral Diagram, NEUTRAL – PE

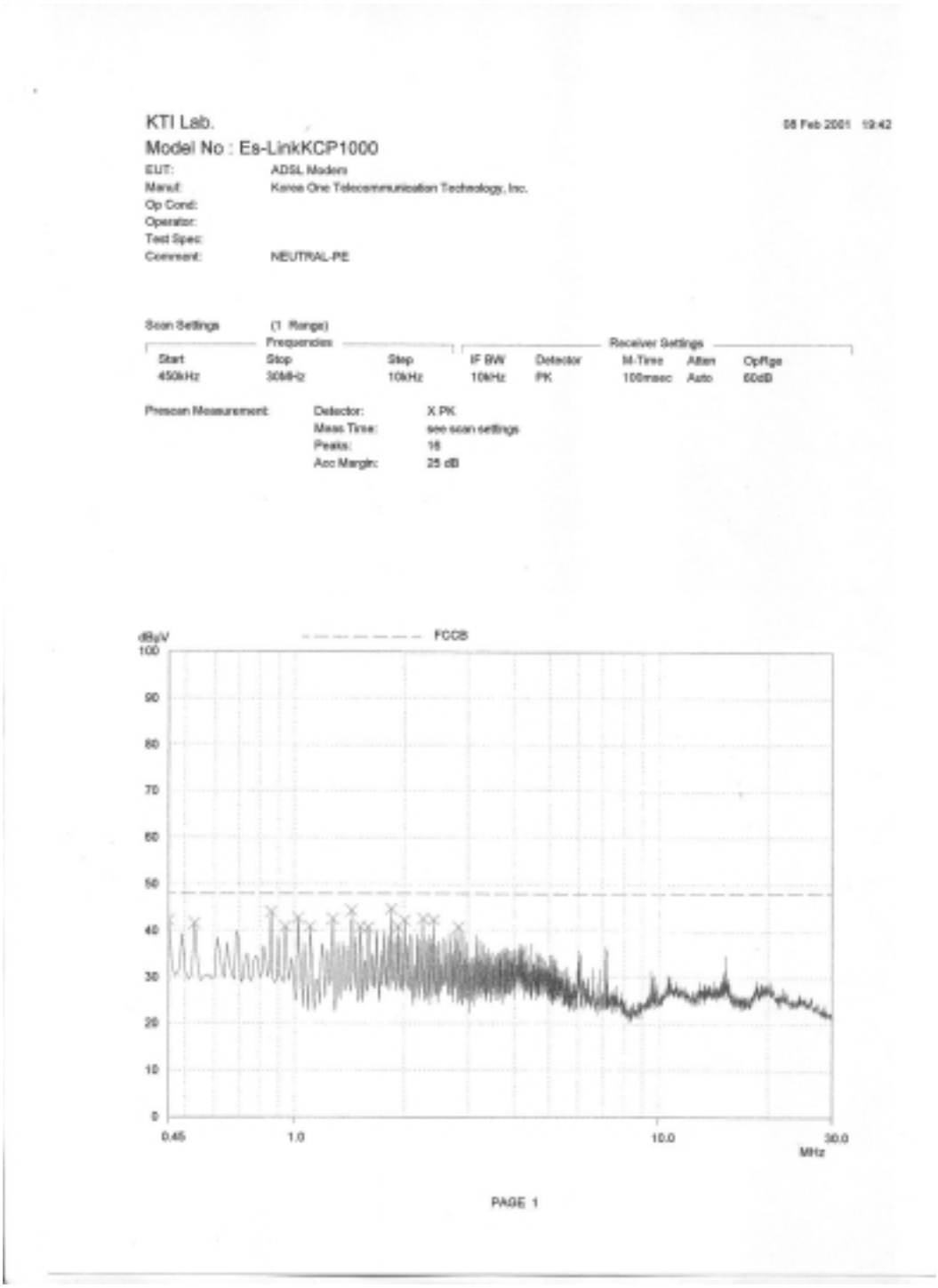


Table 2 : Test Data, Conducted Emissions

Frequency (MHz)	(1)Reading (dB V)	Line	(2)Limit (dB V)	(3)Margin (dB)
0.45	42.27	N	48.00	5.73
0.49	42.22	H	48.00	5.78
0.86	44.12	N	48.00	3.88
1.02	42.85	N	48.00	5.15
1.43	44.42	N	48.00	3.58
1.84	44.81	N	48.00	3.19
2.0	42.30	N	48.00	5.70
2.25	42.64	N	48.00	5.36
2.41	42.38			

5.2 Radiated Emissions

Result : Pass

Preliminary measurements were made indoors at 1 meter using broadband antennas, broadband Amplifier, and spectrum analyzer to determine the frequency producing the maximum EME.
Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found.
The spectrum was scanned from 30 to 300 MHz using biconical antenna and from 300 to 1000 MHz using log-periodic antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used.

Final measurements were made outdoors at 3-meter test range using O.K antennas. The test equipment was placed on a wooden table situated on a 4x4 meter area adjacent to the measurement area. Turntable was to protect from weather in the dome that made with Polyethylene film. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using EMI/Field Intensity Meter(ESPC) O.K. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120kHz or 1 MHz depending on the frequency or type or signal.

The half-wave dipole antenna was tuned to the frequency found during preliminary radiated Measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8=meter high non-metallic 1 x 1.5 meter table.
The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed, and/or support equipment, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission.
Photographs of the worst-case emission can be seen in photograph of radiated emission test.
Each EME reported was calibrated using self-calibrating mode.

Table 3 : Test Data, Radiated Emissions

Frequency (MHz)	Pol.	Height [m]	Angle [°]	(1) Reading (dB V)	(2) AFCL (dB/m)	(3) Actual ((dB V/m)	(4) Limit (dB V/m)	(5) Margin (dB)
53.95	V	392	205	14.2	13.43	27.63	40	17.37
70.3	H	397	286	9.4	8.51	17.91	40	22.09
72.35	V	378	30	9.0	8.51	17.51	40	22.49
74.1	V	323	360	14.5	8.51	23.01	40	16.99
78.9	H							