ESTECH Co., Ltd. 3rd Fl., Chungdam Bldg., 119-1 Chungdam-dong, Kangnamgu, Seoul	MIC KOLAS VCCI FC	**Electromagnetic Interference Test Report**

Compliance Test Report for FCC

Report Number		ESTF150204-003			
Applicant	Company name	MIP Telecom Inc.			
	Address	2F KMIT Bldg., 829-1 Yeoksam1-Dong Gangnam-Gu, Seoul, Korea 135-936			
	Telephone	82-2-557-3399			
Product	Product name	VoIP Gateway			
	Model No.	COMBOX	Manufacturer	MIP Telecom Inc.	
	Serial No.	P0201AD00140021	Country of origin	KOREA	
Test date	2002-04-04 ~ 2002-04-11		Date of issue	2002-04-30	
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea				
Standard	FCC PART 15 2001 , ANSI C 63.4 2001				
Test item	■ Conducted Emission	□ Class A ■ Class B	Test result	OK	
	■ Radiated Emission	□ Class A ■ Class B	Test result	OK	
Measurement facility registration number		94696			
Tested by	Senior Engineer J.M. Yang	(Signature)			
Reviewed by	Director T.K. Lee	(Signature)			
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable				

* Note

- 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 based on a single evaluation of one sample of the above mentioned

Contents

1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and is tested in accordance with the measurement procedures as indicated in this report.
ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.
ESTECH Lab assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name : ESTECH Co. Ltd

Head Office : 3 rd Fl., Chungdam Bldg., 119-1 Chungdam-dong Kangnam-gu , Seoul, Korea
(Safety & Telecom. Test Lab)

EMC Test Lab : 58-1 Osan-Ri, GaNam-Myon, YeoJoo-Gun, KyungKi-Do, Korea
97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea

Branch Office : USA-ESTECH INC.
21801 Stevens Creek Blvd. Suite 2A Cupertino, CA95014

1.3 Official Qualification(s)

MIC : Granted Accreditation from Ministry of Information & Communication for EMC, Safety and Telecommunication
KOLAS : Accredited Lab By Korea Laboratory Accreditation Schema base on CENELEC requirements
FCC : Filed Laboratory at Federal Communications Commission
VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE

2. Description of EUT

2.1 Summary of Equipment Under Test

Product : VoIP Gateway

Model Number : COMBOX

Serial Number : P0201AD00140021

Manufacturer : MIP Telecom Inc.

Country of origin : KOREA

Rating : Out put : DC 12V, 1A

Receipt Date : 2002-4-1

2.2 General descriptions of EUT

* The Combox allows voice and fax to travel down the same path as your traditional dat communications
* The Combox support the H.323 and SIP standard based protocol enabling your Combox to communcate with other third-party VOIP Gateway or other endpoints that support the H.323/SIP protocols, such as Microsoft MSN Messenger
* This Product has one PSTN, one Phone Line, a 10 Mbps Ethernet Lan interface, and an WAN port

3. Test Standards

Test Standard : FCC PART 15 (2001)

This Standard sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

Test Method : ANSI C 63.4 (2001)

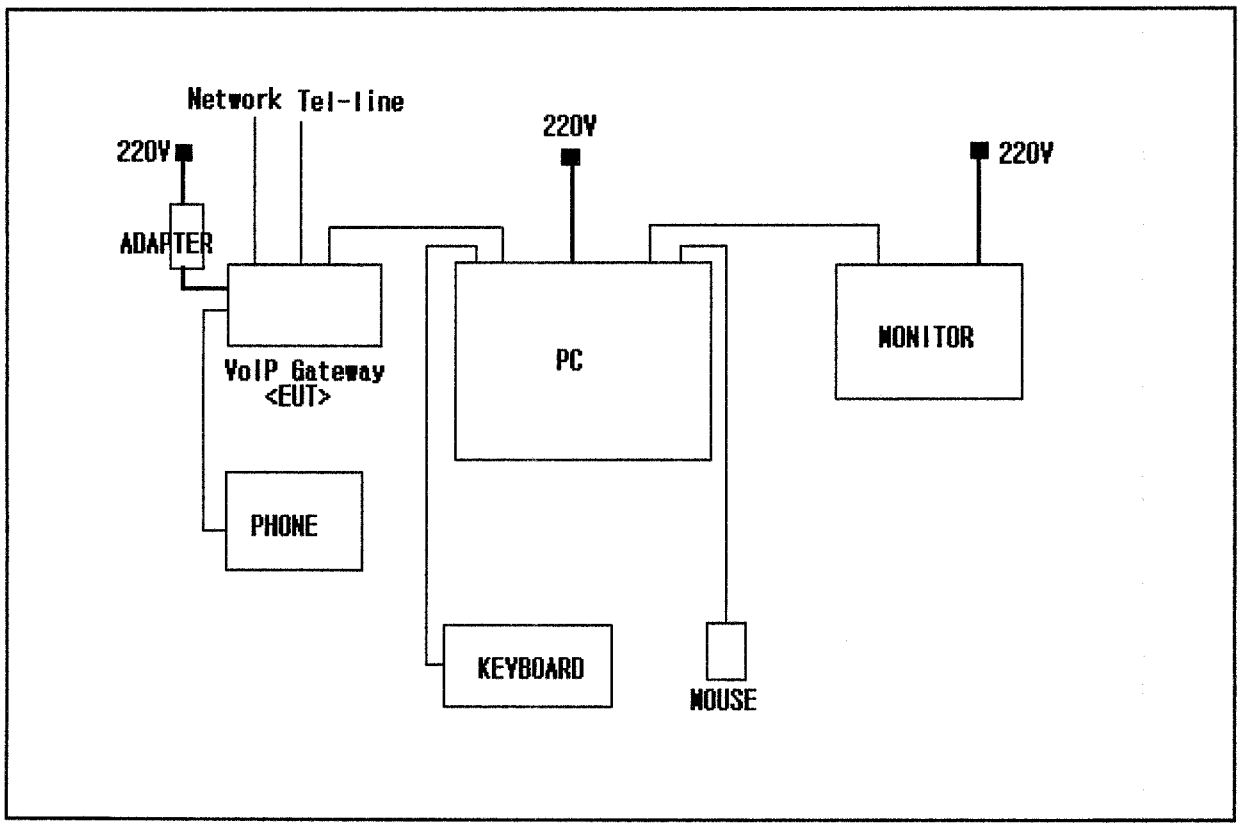
This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain decides that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment These method apply to the measurement of individual units or systems comprised of multiple units

4. Measurement Condition

4.1 EUT Operation.

* The EUT was in the following operation mode during all testing
* The operational conditions of the EUT was determined by the manufacturer according to the typical use of the EUT with respect to the expected hightest level of emission
* Using ping command between external Network, Transmission and Receiving test at between esternal Network

4.2 Configuration and Peripherals



4.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
VoIP Gateway	COMBOX	P0201AD00140021	MIP Telecom Inc.	EUT
PC	M6030	ERA00236	Samsung Electronics Co., Ltd.	-
MONITOR	D8897	CN11104168	HP	ARSCM350S
MOUSE	M-S48a	HCA11804896	Logitech	JNZ201213
KEYBOARD	7800	K19120116	BTC Telecom Co., Ltd	-
PHONE	NONE	NONE	Telrad	-
ADAPTER	JE-1210	NONE	Jungeun eletronic Co., Ltd.	-

4.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
PC	Video	Monitor	Video	2	Y	
PC	PS/2 Keyboard	Keyboard	PS/2 Keyboard	2	N	
PC	PS/2 Mouse	Mouse	PS/2 Mouse	2	N	
VoIP Gateway	10/100BaseTx	PC	10/100BaseTx	2	N	
VoIP Gateway	Phone	Phone	-	2	N	
VoIP Gateway	Tel-Line	Tel-Line	Tel-Line	25	N	
VoIP Gateway	Power	Adapter	-	2	Y	
VoIP Gateway	WAN	Network	10/100BaseTx	25	N	

5. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2001) & ANSI C 63.4 (2001). The test setup was made according to FCC Part 15 (2001) & ANSI C 63.4 (2001) on an open test site, which allows a 3m distance measurement. The EUT was placed in the center of wooden turntable. The height of this table was 0.8m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test set-up.

5.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Receiver	ESPC	Rohde & Schwarz	838248/001	2003. 1. 31
LogBicon Antenna	VULB 9160	S/B	3107	2002.5.9
Turn Table	2087	EMCO	2129	-
Antenna Mast	2070-01	EMCO	9702-203	-
Amplifier	310N	Sonoma Instrument	185817	2002.9.27
ANT Mast Controller	2090	EMCO	1535	-
Turn Table Controller	2090	EMCO	1535	-

5.2 Environmental Condition

Test Place : Open site (3m)
Temperature (°C) : 25 ℃
Humidity (%) : 45 %

5.3 Test data

Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dBμV/m)
46.90	20.00	V	1.0	11.95	1.30	40.0	33.25	-6.75
47.21	20.00	V	1.0	11.94	1.30	40.0	33.24	-6.76
75.00	25.00	V	1.0	9.14	1.70	40.0	35.84	-4.16
100.00	21.00	V	1.0	9.51	2.00	43.5	32.51	-10.99
125.00	21.50	V	1.0	11.60	2.30	43.5	35.40	-8.10
143.21	17.50	H	2.2	12.80	2.53	43.5	32.84	-10.66
150.00	18.50	H	2.0	13.17	2.60	43.5	34.27	-9.23
200.02	21.50	H	1.6	9.80	2.90	43.5	34.20	-9.30
250.05	23.50	V	1.0	11.61	3.50	46.0	38.61	-7.39
286.40	23.50	V	1.0	12.77	3.76	46.0	40.03	-5.97
287.43	21.00	H	1.0	12.79	3.77	46.0	37.57	-8.43
320.00	19.50	H	1.1	13.59	4.00	46.0	37.09	-8.91
336.04	17.00	H	1.1	13.98	4.24	46.0	35.22	-10.78
400.00	12.50	H	1.0	15.45	4.70	46.0	32.65	-13.35
500.00	19.50	H	1.6	17.34	5.30	46.0	42.14	-3.86
576.08	11.80	H	1.8	18.91	5.86	46.0	36.57	-9.43
600.00	16.50	V	1.6	19.55	5.70	46.0	41.75	-4.25
624.08	11.50	H	1.6	19.66	5.94	46.0	37.10	-8.90
650.02	9.50	H	1.3	20.00	6.15	46.0	35.65	-10.35
688.22	9.50	H	1.2	20.43	6.26	46.0	36.19	-9.81
700.02	14.50	H	1.1	20.61	6.20	46.0	41.31	-4.69
750.02	11.00	V	1.0	21.78	6.65	46.0	39.43	-6.57
800.00	12.00	H	1.0	22.29	6.70	46.0	40.99	-5.01
850.00	10.00	V	1.0	22.60	7.25	46.0	39.85	-6.16
950.00	7.50	V	1.0	23.96	7.80	46.0	39.26	-6.74
Remark	H : Horizontal, V : Vertical							

6. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.45 to 30 MHz was measured in accordance to FCC Part 15 (2001) & ANSI C 63.4 (2001) The test setup was made according to FCC Part 15 (2001) & ANSI C 63.4 (2001) in a shielded. The EUT was placed on a non-conductive table at least 80 above the ground plan. A grounded vertical reference plane was positioned in a distance of 40cm from the EUT. The distance from the EUT to other metal surfaces was at least 0.8m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0m.. The test receiver with Quasi Peak detector complies with CISPR 16.

6.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
LISN	ESHS-Z5	Rohde & Schwarz	838979/010	2003. 2. 1
LISN	NNLA81020A	Schwarzbeck	8120161	2003. 2. 1
TEST Receive	ESPC	Rohde & Schwarz	838248/001	2003. 1. 31

6.2 Environmental Condition

Test Place : Shield Room
Temperature (°C) : 22 ℃
Humidity (%) : 48 %

6.3 Test data

Frequency (MHz)	Reading (dBμV)	Line (H/N)	Correction Factor		Limit (dBμV)	Result (dBμV)	Margin (dBμV)
			Lisn (dB)	Cable (dB)			
0.524	36.03	N	0.07	0.2	48.00	36.30	-11.70
0.536	35.35	N	0.07	0.2	48.00	35.62	-12.38
0.572	32.43	H	0.08	0.2	48.00	32.71	-15.29
0.532	30.10	H	0.08	0.2	48.00	30.38	-17.62
0.714	29.20	H	0.09	0.2	48.00	29.49	-18.51
0.998	25.77	H	0.10	0.2	48.00	26.07	-21.93
8.514	27.56	H	0.39	0.5	48.00	28.45	-19.55
16.106	23.64	N	0.63	0.8	48.00	25.07	-22.93
12.186	22.65	N	0.47	0.7	48.00	23.81	-24.19
26.608	22.17	H	0.96	0.9	48.00	24.03	-23.97
11.994	22.06	H	0.56	0.7	48.00	23.30	-24.70
15.232	21.69	N	0.61	0.8	48.00	23.10	-24.90
Remark	H : Hot Line, N : Neutral Line						